DIV. OF FISHES

COMMERCIAL FISHERIES REVIEW

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Vol. 18, No. 6 June 1956

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE
JOHN L. FARLEY, DIRECTOR

COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BRANCH OF COMMERCIAL FISHERIES

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Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, August 2, 1955. (8/31/57)

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COMMERCIAL FISHERIES REVIEW

June 1956 Washington 25, D. C. Vol. 18, No. 6

TECHNOLOGICAL STUDIES ON THE PROCESSING OF SEA LIONS

By Robert M. Kyte*

ABSTRACT

Sea lions are predators on the commercial fisheries of Alaska. Under certain conditions the processing of sea lions by cold-storage and reduction plants in Alaska might be attractive. The proximate composition of sea lions was determined. The quality of the products that might be produced is discussed.

BACKGROUND

As a result of widespread complaints from commercial fishermen of the depredations caused by Steller's sea lions (Eumetopias jubata) and on a basis of a study of the sea lion habits by Imler and Sarber (1947), and other information, the ban from hunting sea lions was removed in 1949. This removal of protection apparently has not reduced appreciably the size of the sea lion herds that cause annoying loss of fish to commercial fishermen, particularly those fishing for halibut and sablefish. A further study of the habits and general biology of these predators is currently being carried out by the Alaska Department of Fisheries under a Saltonstall-Kennedy fund contract awarded by the U. S. Fish and Wildlife Service. To find a commercial use for a predator is one of the best methods for its control. It is with this in mind and also to aid in the harvesting of a possibly valuable resource that additional studies on the technology of handling sea lions are being carried out.

A 650-pound female sea lion.

FACTS ABOUT SEA LIONS

The commercial processing of sea lions would require capturing a large number of the animals. It is very difficult to recover sea lions if they are in the water. It takes a carefully placed shot in the head to kill a sea lion and most of the animals sink quickly when killed. A wounded animal usually escapes capture by diving under water and swimming away or by dying on

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the bottom where he cannot be recovered. A better way then to recover sea lions is to kill them when they are on the land. During June and early July the sea lions haul

A 525-pound mature female sea lion

Skinning a 650-pound sea lion. Cut indicates blubber thickness on brisket.

out on wave-beaten rocks and islands to have their pups and to breed. The rookeries are in exposed locations off the coast of Alaska and extend from Southeastern Alaska to far out among the Aleutian Islands and into the Bering Sea. Here the male holds

Table 1 - Measurements and Yield Data for Sea Lions of Varying Size and Sex

No.	Sex	Length (Nose to Tip of Tail)	Girth (Under Fore-flippers)	Blubber Thickness (on Brisket)	Total Weight	Liver		Hide		Meat (Free of Bone and Blubber)		Blubber	
		(Inches)			(Lbs.)	Weight (Lbs.)	% Total Body Wt.	Weight (Lbs.)	% Total Body Wt.	Weight (Lbs.)	% Total Body Wt.	Weight (Lbs.)	% Total Body Wt.
1	Male	-	-	-	425	13	3.1	28	6.6	274	35.7	63	14.8
2	Female	-	-	-	343	14	4.1	21	6.1	274	35.7	54	15.8
3	Male	87	73	1¼	695	19	2.7	-	-	-	-	-	-
4	Female	98	67	-	527	25½	4.8	-	-	-	-	-	-
5	Female	97	64	1¼	643	20	3.1	36	5.6	202	31.4	79	12.3
6	Female	89	54	-	484	14½	3.0	24	5.0	153	31.6	52	10.8
7	Male	109	82	2½	1,121	26	2.3	70	6.2	341	30.4	128	11.4

Animals 1 and 2 were sexually immature, probably 2- or 3-year olds.
Animal 3 was in a semidecomposed state when found ashore and complete data were not obtainable.
Animal 4 had well developed fetus and appeared to be nursing; 26 pounds of mammary tissue and milk were recovered. Only partial data were obtained.
Animals 5 and 6 each had a well-developed fetus; no indication of nursing.
Animal 7 had a stomach which weighed 102 pounds; stomachs of other animals weighed less than 20 pounds each. Stomach weights of all animals are included in the total weight.

a harem of 10 to 20 females. The cow bears a single pup and again breeds before she returns to the sea to feed. (Kenyon and Scheffer 1953.) At other times herds of sea lions use favorite rocks to haul out on and rest. The resting spots are exposed places either along the coast or near the mouth of streams.

Table 2 - Proximate Composition of Meals Prepared from Sea Lions

Type of Meal	Moisture	Oil	Protein	Ash
	(Percent)			
Liver meal	12.8	19.7	51.1	5.2
Viscera meal	8.0	20.2	70.2	2.9
Bone meal	5.2	27.6	44.7	22.3
Meat meal	5.9	27.0	58.9	3.9

Note: The analyses account for only 88.8 percent of the liver meal and 95.7 percent of the meat meal. Glycogen and other carbohydrates perhaps account for the balance.

Local fishermen and U. S. Fish and Wildlife Service agents and reports (Imler and Sarber 1947) were consulted in plotting on charts the size and location of sea-lion rookeries and hauling-out grounds in southeastern Alaska. A number of rookeries located within a day's run of the herring reduction plants were indicated. Two of the largest rookeries, Forrester Island

and Hazy Islands, are bird refuges on which hunting is prohibited. However, several of the fishermen thought it possible for a crew of four on a salmon seine boat to recover 500 sea lions during the six-week breeding season of June to mid-July. Much larger rookeries, with shorter hauls to reduction plants and cold-storage facilities, are available in the Kodiak-Cook Inlet area.

Table 3 - Proximate Composition of Sea Lions and Herring

Specimen	Moisture	Oil	Protein	Ash
	(Percent)			
Sea lion	58.2	22.1	16.4	3.1
Herring	66	16	16	2

ANALYSES OF SEVEN ANIMALS

Seven animals were recovered near Ketchikan, Alaska, in December 1955 and January 1956 and processed to get information and data which would be of value to

Removing hide and blubber from a 650-pound sea lion at Ketchikan, Alaska.

A 650-pound sea lion with hide and blubber almost removed.

cold-storage and reduction-plant operators in estimating the economics of a sea-lion operation. The yield of meat, blubber, liver, and hide obtained from animals of varying size and sex are reported in table 1.

Table 4 - Proximate Composition of Sea Lion Mammary Tissue from a Nursing Cow and of Sea Lion Blubber

Analyses	Mammary Tissue	Blubber
	(Percent)	
Moisture	40.7	16.0
Oil	48.4	78.8
Protein	11.6	5.0
Ash	0.9	0.2

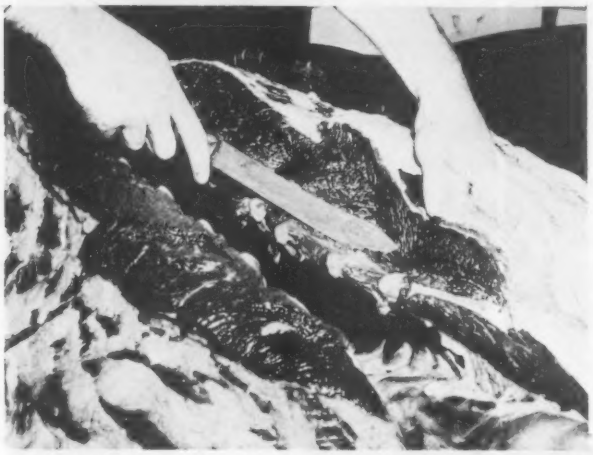
The data indicate significant differences between individuals, but roughly 33 percent of the carcass weight is meat, 12 percent blubber, and 6 percent hide. The liver, a fairly rich source of vitamins, is large--almost 3 percent of the carcass weight. The meat reported is that which could easily be recovered in butchering. Most of the "fat-free" meat comes from the neck, foreflippers, and brisket where the meat is 4 to 6 inches thick. This meat was cut free of bone and blubber,

packaged in polyethylene bags and frozen for mink-feeding studies at the Experimental Fur Station, Petersburg, Alaska. Analysis of the meat indicated a much

Table 5 - Some Physical and Chemical Constants for Sea Lion Blubber Oil and Viscera Oil and Fur-Seal Blubber Oil

Analyses	Sea Lion		Fur-Seal
	Blubber Oil	Viscera Oil	Blubber Oil
Specific gravity 25° C. ...	0.9208	0.9175	1/ 0.9254 (60° F)
Iodine value	136.9	139.4	2/ 137.3
Saponification equivalent ..	181.1	187.3	1/ 181.2
Unsaponifiable matter.....	1/ 1.4	-	2/ 0.4

1/ Bailey, Carter, and Swain (1952).
2/ Data for 1954 fur-seal oil produced on Pribilof Islands. The data were obtained from the general manager of the Pribilof Islands in a personal communication.



Butchering a 650-pound female sea lion. Meat thickness on brisket is 4-6 inches.

higher fat content (8-13 percent) than the 2.5 percent reported by Dassow (1955). This higher fat content was probably the result of two factors: First, to remove all the blubber when skinning demands more care and time than would be practical for a commercial operation; second, portions of the meat had a higher fat content than the particular dark lean tissues sampled by Dassow. Fur farmers seek a feed with low fat content because unsaturated acids in fats quickly become rancid. The deposit of rancid fat in the tissue of mink and other animals is associated with "yellow fat" disease. The fat is not so objectionable in fish-hatchery feeding. Methods of producing meat of lower fat content will be investigated. This might be accomplished either through different butchering techniques or by selecting for these market outlets those sections of the carcass in which the oil content of the meat is low.

Meat on brisket of 650-pound sea lion is 4-6 inches thick.

MEALS

To determine the proximate composition and protein quality of meals that might be produced from sea lions, the entire carcasses (except the hide and blubber) of animals 1 and 2 were separated into fractions and dried to meals. The meals were prepared by grinding the fraction into pieces $\frac{1}{4}$ inch or less and then drying in circulating air at a controlled temperature of 150° F. The viscera was cooked, to aid in handling, for 20 minutes at 240° F. before grinding. The proximate analyses of these meals are shown in table 2.

Removing lean meat (to be used for mink feeding tests) from sea lion carcass at the Fishery Products Laboratory, Ketchikan, Alaska.

The viscera meal included all of the viscera except the liver, which was treated separately, and the stomach and sex organ which were saved for biological study. The bone meal includes all of the bones from which the meat had been removed, together with the head and flippers with their attached hide and blubber. The meat meal was representative of the bone- and blubber-free meat.

The results of chick-feeding tests at the University of California indicated the liver-meal protein to be of good quality (comparable to the best fish meals) and the viscera-meal protein to be of fair quality. The other meals have not yet been evaluated by chick-feeding tests.

PROXIMATE COMPOSITION OF CARCASS

From the proximate analyses of the liver meal, viscera meal, and bone meal and representative samples of the meat and blubber, the following proximate composition of the whole carcass (less hide) of sea lions 1 and 2 was calculated. This proximate composition, together with a proximate composition of herring for comparison, is shown in table 3.

The oil content of these sea lions is high. The seasonal variations in the composition of sea lions is not yet known. Fishermen report bull seals to have a particularly thick layer of blubber when first seen on the rookeries in late May. Perhaps this store of blubber sees them through the fasting of the breeding season. If this is so the fat content of the animal would vary considerably with the season of capture.

Sea lion 4 (table 1) was carrying a well-developed fetus (6 pounds) and, in addition, had well-developed milk-secreting mammary tissue extending through the blubber from the foreflippers to the tail flipper. This mammary tissue weighed

26 pounds or approximately 40 percent of the total blubber weight. This animal might be similar in composition to the females recovered from rookeries during the mating season. The proximate composition of the mammary tissue is compared with that of the blubber in table 4.

The calculated composition of a nursing cow is then 59.8 percent moisture, 20.0 percent oil, 17.2 percent protein, and 3.1 percent ash. As was expected, the cow showed a lower oil content and higher protein content than the immature animals whose composition is given in table 3.

Placing sea lion meat wrapped in polyethylene bags in freezer. Frozen meat was shipped to Petersburg, Alaska, for mink-feeding experiments.

OIL

Samples of oil were rendered from the blubber and from the viscera of the sea lions. Some of the chemical and physical constants of these oils are given in table 5. Fur-seal oil is included in the table for comparison. It is apparent that the chemical composition of these oils is very similar.

Table 6 shows the price paid early in September for seal, herring, and menhaden oil for the last five years.

Fur-seal oil follows the general trend of fish-oil market prices. However, since it finds a special market in the leather industry, in two of the last five years it brought a premium price above fish oils. Similar trends might hold true for predicting the market value of sea-lion oil.

HIDES

The hides of sea lions produce on tanning a heavy-bodied leather which can be split to make a soft durable leather. However, the leather appears at this time to be of no commercial value because the hides have too many defects, e.g. cuts and scars (Dassow 1955). Investigation of new uses for sea lion hides is being carried out at this laboratory.

UTILIZATION OF SEA LIONS

Interest in utilizing sea lions has been keen, but no one has yet undertaken a commercial operation. The butchering and reduction of sea lions and hair seals might be attractive to a herring reduction plant operator during periods when the herring fishery was closed. This would be true particularly during the time when the quota for the first half of a season had been met and before the second half of the season opened. In addition, an operator with cold storage facilities as well as reduction plant equipment might find butchering sea lions a profitable way to utilize idle plant capacity. The meat so preserved might be sold for fur animal or fish food at a better price later in the season.

SUMMARY

Sea lions are predators on the commercial fisheries of Alaska causing continuing financial loss and annoyance to the fisherman. A good way to control a predator is to find a commercial use for it. Investigation indicated a number of small sea-lion

rookeries in southeastern Alaska within one day's run of existing cold-storage and reduction plant facilities. Under certain conditions the handling of sea lions by these plants might be attractive.

Table 6 - Price the First Week in September for Fur-Seal, Herring, and Menhaden Oil, 1951-55

Year	Average Market Price in Cents/Pound		
	Fur-Seal Oil 1/	Herring Oil 2/	Menhaden Oil 2/
September 1955	9.50	8.25	7.75 - 8.25
" 1954	7.80	8.00- 8.50	7.75 - 8.00
" 1953	7.60	7.25- 7.75	6.125- 7.00
" 1952	6.90	6.75	6.50
" 1951	13.10	10.00-11.00	10.00 -10.50

1/ Selling price in Seattle of fur-seal oil produced on Pribilof Islands. This oil is usually marketed early in September. The prices were obtained from the general manager of the Pribilof Islands in a personal communication.

2/ Data obtained from the daily "Fishery Products Market Report," Market News Service, U. S. Fish and Wildlife Service, Seattle, Wash.

Seven sea lions were caught near Ketchikan, Alaska, in December 1955, and January 1956. From these animals the yields of meat, liver, blubber, and hide were determined and the proximate composition of an immature animal and a nursing cow were calculated. The oil rendered from sea-lions was found to be similar in chemical composition to fur-seal oil, an oil which usually follows the market price of fish oils, but in some years brings a premium over fish oils.

The meat from sea lions comprises about one-third of the carcass weight and might find a market in fur-animal or fish-hatchery feeding, competing with whale and horse meat. No commercial use has yet been found for the hide.

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CHITIN THREADS FROM LOBSTER SHELLS

It is stated that a method for preparing crude chitin in good yields from lobster shells has been developed by combining the most attractive features of the conventional methods. The limited experiments carried out at the Fisheries Experimental Station, Halifax, N. S., Canada, are reported to have indicated that chitin threads can be produced easily from lobster shells.

--Trade News, January 1954

IRON SULFIDE DISCOLORATION OF TUNA CANS[1/]

No. 3 - Effect of Variables Introduced by the Fish

By George M. Pigott* and M. E. Stansby**

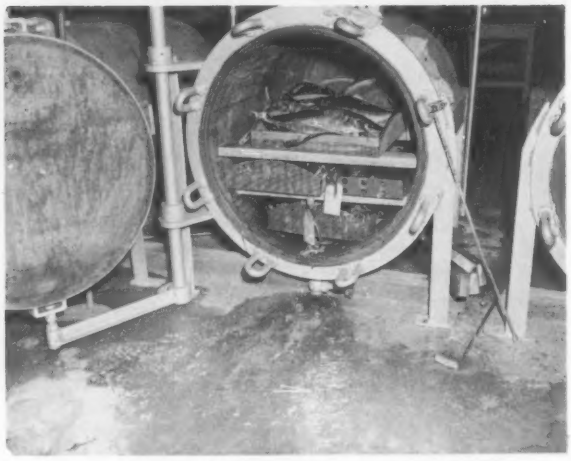
INTRODUCTION

During recent years, certain batches of solid-pack canned tuna have developed an iron sulfide formation on the can area adjacent to the headspace. This paper is the third in a series of six papers in which an investigation of the problem of can discoloration is being reported (Pigott and Stansby 1955).

The degree of spoilage, the length of time that the fish are held in cold storage, and the species of tuna canned are the three primary variables introduced into the canning process attributable to the fish itself. The objective of this paper is to report the results of an investigation of these three variables.

SOURCE OF COMMERCIAL TUNA

Tuna being canned by American packers is from two major sources: the Pacific Ocean off the west coast of the United States and off the northern portion of South America, and the western and central Pacific Ocean.



Experimental fish in retorts for precooking.

Tuna caught off the coasts of the United States and South America are taken by pole and line, by trolling, and by purse-seining. Most of the larger vessels are equipped with freezing brine-tank facilities so that the fish may be frozen shortly after being caught. The freezerships remain on the fishing grounds until the catch is considered a "payload" (a few weeks to several months) before delivering the fish to the canneries. Vessels using ice to preserve the catch are generally out of port about two weeks. These iced fish, referred to as "local fish," are usually packed as soon as they are received at the cannery.

The Japanese fishing fleet accounts for most of the tuna caught in the western and central Pacific Ocean. The Japanese tuna fishery is quite different from that of the United States, owing primarily to the distances the boats must travel and to the depth at which the fish are found. The fish are usually caught by pole and line and by long-lining (Shapiro 1948). Large motherships, equipped with freezing and storage facilities, accompany the fishing fleets to sea and receive the fish from catcher boats. The frozen tuna is taken to Japan where the fish destined to be sold to United States buyers is sorted by size and species and is held in cold storage for shipment.

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1/ This investigation, which was carried out at the Seattle Technological Laboratory, U. S. Fish and Wildlife Service, was jointly sponsored by the Continental Can Company and the U. S. Fish and Wildlife Service.

COMMERCIAL CANNING OF TUNA

Tuna packing is unique among fish-packing operations in that tuna is given a preliminary steam cook (called the precook) before it is canned. The purpose of the precook is to remove the tuna oil and make the fish easier to clean. Frozen tuna is thawed and butchered before being precooked. The butchering consists of removal of viscera and gills.

Successful precooking of tuna depends largely on the ability of the operator to judge the condition of the raw fish. Such variables as oil content and initial temperature of fish have a bearing on the optimum precook. The time of precook varies from 1 to 2 hours for a very small fish to 8 to 10 hours for a very large fish. The temperature of the cooker normally varies from 212° to 220° F. It is important not to bring the cooker temperature up too rapidly or the skin breaks and the meat tissues are injured.

After being precooked, the tuna are cooled--usually overnight--and then cleaned in preparation for packing into the can. This cleaning step consists of removing the head, scraping off the skin, and splitting the fish into four longitudinal loins at which point the backbone is removed. Dark meat and blood are scraped from the section of the loin adjacent to the backbone and to the lateral line. For production of the solid pack, the cleaned loins are then cut into sections that will fit into the cans.

Tuna is normally packed in ½-pound tuna cans designated as 307 x 113 ($3\frac{7}{16}$ inches diameter and $1\frac{13}{16}$ inches high). Approximately $5\frac{1}{2}$ to 6 ounces of meat, $1\frac{1}{2}$ ounces soya or cottonseed oil, and $\frac{1}{8}$ ounce salt are placed into each can. The cans are then closed under vacuum by a can seamer. Most packers retort the closed cans at 240° F. for 75 minutes, after which time the cans are cooled and labeled for marketing.

This outline of tuna packing is very general, since all canners have their own modifications and special techniques in plant operation.

SAMPLES USED IN EXPERIMENTAL WORK

LOCAL ALBACORE: During August 1953, a collection trip was made aboard a tuna vessel off lower California. A total of 74 troll-caught albacore from the commercial catch were tagged for use in sulfide discoloration studies. Three groups of fish averaging 12 to 15 pounds in weight were obtained. The groups were designated as (1) fresh, (2) slightly spoiled, and (3) spoiled.

The fresh fish were caught in the cool of evening and iced shortly after being caught. This group was stored in ice on board the vessel for two days before reaching port. All fish in the group were judged to be in excellent condition when unloaded.

Table 1 - Effect of Precook on Sulfide Content of "Local" Albacore

Sample	Hydrogen Sulfide Content of "Local" Albacore		
	Raw	After ½ Normal Precook	After Normal Precook
	Micrograms Per 100 Gms.	Micrograms Per 100 Gms.	Micrograms Per 100 Gms.
Fresh	16	0	0
Spoiled	26	Trace	0

The fish designated as slightly spoiled were caught in the morning and left on deck approximately 11 hours before being iced. During seven hours of this time the catch was exposed to sunlight (62° to 75° F.). The storage time in ice was four days before reaching port. These fish were judged to be slightly spoiled when unloaded because of a slight off-odor and softness of the meat.

The third group of albacore were caught early one morning and kept on deck until the following morning (approximately 26 hours on deck; 60° to 70° F.). Storage time in ice for this group was 8 days before reaching port. Advanced spoilage was very apparent in this group at the time of unloading. The meat was extremely soft and a very strong odor was detected. The belly cavity of each of these fish gave a strong odor of hydrogen sulfide at the time of butchering.

It should be emphasized that the first two of the above groups of fish were part of the commercial catch for the particular day. That is, these two experimental lots were parts of larger batches which were canned commercially after the fish were landed in San Diego. Every effort was made to duplicate commercial conditions during all phases of catching, handling, and canning of the experimental fish.

The iced fish were quick-frozen immediately after being unloaded in San Diego, Calif., shipped to Seattle, Wash., via refrigerated truck, and stored at -20° F. until needed for experimental work.

The advantage of securing a large batch of tuna of known history, such as this, was that frozen control-samples could be held for all experimental packs. Thus, if an experiment gave significant results, there were always other samples from the same lot with which to extend the studies.

IMPORTED ALBACORE: Imported albacore tuna from Japan were obtained from several canneries. These samples were not as desirable for these experiments as the local albacore, since no information was available as to the catching methods, length of time in cold storage, and other factors.

YELLOWFIN: A large batch of yellowfin tuna was supplied by the Pacific Oceanic Fishery Investigations, U. S. Fish and Wildlife Service. The fish, which ranged from 50 to 150 pounds, were taken by long lines in the South Pacific, frozen, and shipped to Seattle by refrigerated steamer. Tuna from this area that weigh over 120 pounds are often rejected by Hawaiian canners because the meat of the fish develops an off-color after the precook. The off-colored meat ranges from a slightly darker-than-normal to a dark gray-green or brownish-mahogany color.

CANNED COMMERCIAL PACKS: Cans from packs of commercially-canned albacore and yellowfin tuna were obtained from various packers on the West Coast. Samples from "complaint" packs with can discoloration were secured whenever possible.

EFFECT OF SPOILAGE

After fish have been caught, the proteinaceous materials in them deteriorate rapidly, owing to the action of bacteria and enzymes. Therefore, if fresh fish are not frozen or canned soon after being taken from the water, changes take place that are detrimental to the quality of the fish. A series of experiments were carried out to determine the effect of spoilage.

SPOILAGE PRIOR TO PRECOOKING: Sulfide content was determined immediately prior to precooking on two samples from two groups of "local" albacore tuna. One group had been frozen when fresh; the other had been frozen when somewhat spoiled. The fish in each group were then divided into two subgroups, one subgroup being precooked the normal time and the other being precooked one-half the normal time. All samples were again analyzed for hydrogen sulfide after the meat had cooled and was ready for canning. The results, given in table 1, show that precooking drives the free sulfide from the meat so that the fish, as it is ready for canning, contains no loosely-bound sulfide. Throughout this investigation, no free sulfide was found in the many samples of both albacore and yellowfin that were analyzed for sulfide after the fish were precooked and ready for canning.

Raw albacore and yellowfin at different stages of deterioration were precooked and then packed in single-enamel cans of the same type that were used by industry[1/] when the initial outbreaks of sulfide discoloration occurred. In no instance did spoilage of the raw fish cause worse can discoloration than that found with the fresh fish.

SPOILAGE AFTER PRECOOKING: A pack similar to that described above was canned in order to determine whether spoilage occurring in precooked fish had any effect on can discoloration. Albacore and yellowfin were precooked and allowed to stand, at room temperature, for periods up to 4 days and, at 32° F., for periods up to 2 weeks before being canned. These fish showed no signs of spoilage at this stage except for the development of some rancidity in the dark meat. As in the case when the raw fish were spoiled, fish spoiled after precook had no effect on can discoloration.

EFFECT OF TIME IN COLD STORAGE

The fish used in experiments in which the effect of spoilage was investigated had been in cold storage for a period of about one month. Another series of experiments were run in which fish were canned after various periods of cold storage in order to determine whether the oxidation or dehydration that takes place during cold storage had some effect on can discoloration.

The samples of local albacore that were used in this investigation showed no signs of causing can discoloration when canned at intervals up to 14 months. After this group of fish had been in cold storage for 14 months, however, can discoloration was noted when the fish were canned as solid packs.

It was also noted that the groups of albacore that had been spoiled before being frozen and then held for 14 months in the frozen stage caused worse can discoloration than did the group of albacore that was frozen when fresh and then stored.

The yellowfin used in these experiments caused can discoloration to a slight extent when a solid pack was made after one month of cold storage. As these fish were kept in cold storage for longer periods of time, the solid packs prepared from this lot at intervals showed increasing can discoloration.

EFFECT OF SPECIES

In this investigation of iron sulfide discoloration of tuna cans, only raw albacore and yellowfin tuna were used for canning experimental packs. All imported albacore from Japan caused very bad discoloration when packed in single-enamel cans. Yellowfin from the central Pacific also caused discoloration but not as much as did the imported albacore. The local albacore did not cause discoloration until it had been in cold storage for 14 months, after which time the discoloration was comparable to that of the imported albacore. The imported albacore had doubtlessly been held in frozen storage for an extended period of time when they were received, but, unfortunately, the exact storage time was not known.

CONCLUSIONS

From the work reported in this paper, the following conclusions are apparent:

1. Essentially all of the free sulfides in the meat of raw tuna, regardless of the degree of freshness of meat, were driven off during the precook.

1/ Unless otherwise stated all tuna canned throughout this investigation were canned as solid packs in these single-enamel cans so that maximum discoloration would be produced where such an effect had occurred.

2. Of the samples used in this work, spoilage either before or after precooking had no effect on discoloration unless the fish were subsequently stored for extended periods in which case the spoiled fish caused somewhat greater discoloration.

3. Increasing the length of time the fish were in cold storage increased the tendency for tuna to cause can discoloration.

4. With the samples of tuna used in this work, the length of time in cold storage had more effect on can discoloration than did the species.

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NEW ARTIFICIAL ICE

A new type of artificial ice is being used for chilling perishable foods prior to their distribution. The ice is made up of cold-retaining substances in a colloidal solution held in gel base and it does not evaporate or melt into liquid under the conditions in which the foods are handled. By modifying the chemical formula, the refrigerant can be frozen at -1.1° C., -12.2° C., and -22.2° C. (30°, 10°, and -8° F.), the freezing time being the same as that of water. The ice has been reported to be used 120 times during a period of 4 months by refreezing. It is said to lose its chilling qualities slowly, thereby insuring an even refrigeration of the product.

--National Provisioner, August 15, 1953.

FISH OILS IN SPRAYS FOR CITRUS TREES

The quaternary ammonium salts of unsaturated fatty acids from menhaden oil have been prepared by chemists of the U. S. Fish and Wildlife Service's Fishery Technological Laboratory. Preliminary tests by Dr. Boris Sokoloff who is carrying out contract research (with funds provided by the Saltonstall-Kennedy Act) for the U. S. Fish and Wildlife Service at Florida Southern College, Lakeland, Fla., have indicated that this substance shows promise as a fungicide for spraying citrus trees.

Quaternary ammonium salts have been used extensively in industry to make use of their surface active and bactericidal properties. Fish oils have been shown in previous experimental work by Dr. Sokoloff to possess desirable properties for application as a spray in the citrus industry. By preparation of the quaternary ammonium salts of the unsaturated fish oil fatty acids, it is hoped to combine the beneficial effects of both in a single compound. Extensive laboratory and orchard tests still remain to be carried out before the full value and methods of application for fish oil products of this type can be established.

The quaternary ammonium salt was made by first preparing the unsaturated fatty acid alcohols from menhaden oil by sodium reduction. The unsaturated alcohols were then separated by fractional crystallization, and the alkyl iodides prepared. These were then reacted with triethyl amine to form the quaternary ammonium salt, $R\overset{+}{N}(CH_3)_3\ \bar{I}$ where R is the mixed unsaturated menhaden oil fatty acids.

Note: See Commercial Fisheries Review, March 1956, p. 9.

ALASKA SHRIMP WASTE HAS POSSIBILITIES AS HATCHERY FOOD

Preliminary experimental work has indicated that meals prepared from the waste of Alaska's shrimp industry may be a valuable feed for trout. Feeding tests were conducted recently at the Oregon State College Seafoods Laboratory, Astoria, Ore., with sample shrimp-waste meals prepared at the Fishery Products Laboratory, Ketchikan, Alaska. The tests indicated that the shrimp meal, because of some unknown factors, promoted an outstanding growth rate when fed to rainbow trout. The color characteristics imparted to the trout were superior also.

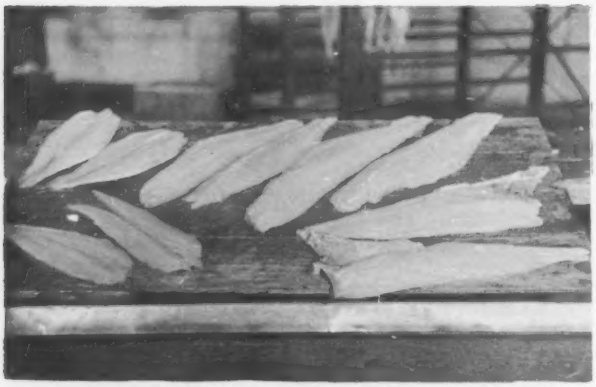
Further work on marketing and production problems must be carried out, however, before utilization of the approximately one million pounds of waste dumped annually by the Alaska shrimp industry becomes a reality.

TECHNICAL NOTE NO. 33 - REDUCTION OF DEHYDRATION IN FROZEN FISH-FILLET BLOCKS

Dehydration or the loss of moisture in fishery products during storage has been a major consideration in the fishery industry since the inception of freezing and cold-storage processes. A loss in moisture of as little as 2 percent of the weight of the stored product has been found to affect adversely the flavor and texture of the product (Adams, Klein, and Simerl, 1953). Elaborate packaging procedures have been developed to minimize such losses in the finished marketed products. However, only the most primitive methods of minimizing dehydration of the product have been applied in the frozen fish-fillet block industry.

The great majority of blocks have been prepared, frozen, and stored in cold-water-waxed, kraft-fiber cartons. For shipment and subsequent storage, most blocks are then packed in corrugated cardboard master cartons. Neither of these types of packaging materials are considered to be effective barriers to the passage of water-vapor.

A consequence of such packaging has been the serious dehydration problem found in representative lots of blocks subjected to grading according to the proposed standards for frozen fish-fillet blocks. In groups of five blocks of the same history, the degree of dehydration found varied from negligible to excessive amounts.



Fillets of the type used in the manufacture of fish blocks.

Fiber-cartoned blocks in storage have shown marked dehydration in a period of time as short as three months. The spongy, dead-white appearance of the exposed surfaces became progressively more pronounced as storage continued. After 5 months of storage, the dehydration extended from $\frac{1}{8}$ to $\frac{1}{4}$-inch into the product. The dry and woolly, spongy material could be scraped from the surface of the block, exposing the solidly frozen meat in the interior of the block. The flavor and texture of such blocks, when heated, was unsatisfactory, being dry, tough, and flavorless. This was also true of products prepared from such blocks.

Even a slight degree of added protection afforded a considerable lengthening of storage life without undue dehydration. A sheet of moisture-vaporproof cellophane, placed on the surface of the block of unfrozen fillets and extending over the sides of the container to be locked into place by the cover, effectively reduced moisture transfer during subsequent storage. Frozen blocks wrapped in heavy-duty aluminum foil have been held in frozen storage for periods of over a year without noticeable dehydration.

During 1955, a total of 48 million pounds of frozen fish-fillet blocks, valued at over $9 million, were produced. If the production of frozen fish-fillet blocks is to retain its importance in the fishing industry, greater attention must be paid to the

maintenance of quality in the product. Not the least of these problems is the use of proper packaging materials to reduce dehydration during storage.

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U. S. FISH AND WILDLIFE SERVICE,
EAST BOSTON, MASS.

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INTERIM FEDERAL SPECIFICATIONS FOR CANNED SARDINES

The Interim Federal Specification for canned sardines (PP-S-0051c) was issued March 5, 1956, by the U. S. General Services Administration (GSA). It was developed by the U. S. Fish and Wildlife Service and the Quartermaster Corps Food and Container Institute for the Armed Forces. It is authorized as a valid waiver to Federal Specification PP-S-51b for use by all Federal agencies for the purchase of the product. It will be converted to a Federal specification after further coordination.

The new specifications are now in force for procurement but are subject to change after a six-month trial period.

The specifications were first established in 1933 and revised in 1938 and now have been brought up to date to cover many changes and improvements in the packing procedures. Among the changes has been the development of a 12-ounce institutional pack now eligible for Federal procurement.

Putting cans of sardines into cartons in a Maine canning plant.

GROWING ALGAE

The best method of growing and harvesting algae is said to be by circulating them rapidly through thin plastic tubes which expose the cells to light for only a fraction of a second at a time, permitting them to utilize the sunlight most efficiently. The bright green paste which is gathered by settling is said to taste something like raw lima beans. A harvest of 17.5 metric tons of dry algae per acre per year is foreseen. The one-celled algae when dried contain about 50 percent protein.

--Food Field Reporter, August 24, 1953.

Additions to the Fleet of U. S. Fishing Vessels

MARCH 1956: A total of 17 vessels of 5 net tons and over were issued first documents as fishing craft during March 1956, according to the U. S. Bureau of Customs. This was 14 vessels less than the number reported for the same month last year.

U. S. Vessels Issued First Documents as Fishing Craft, March 1956 with Comparisons

Section	March		Jan.-Mar.		Total
	1956	1955	1956	1955	1955
	(Number)				
New England	1	1	5	6	18
Middle Atlantic	2	2	7	3	13
Chesapeake	4	-	12	9	54
South Atlantic	1	3	11	9	65
Gulf	5	11	15	19	103
Pacific	1	11	4	17	117
Great Lakes	2	2	2	2	9
Alaska	1	1	3	8	35
Hawaii	-	-	1	-	3
Virgin Islands	-	-	-	-	1
Total	17	31	60	73	418

Note: Vessels have been assigned to the various sections on the basis of registered home ports.

The Gulf area led all others during March 1956 with 5 newly-documented craft, followed by the Chesapeake with 4, the Middle Atlantic and Great Lakes with 2 each, and the Alaskan, New England, and South Atlantic with 1 each.

Compared with the same month of last year, in March 1956 the Gulf area had 6 less vessels and the Pacific Coast States had 10 less newly-documented craft added to their fishing fleets. The Chesapeake area had no newly-documented vessels during March 1955.

During the first quarter of 1956, a total of 60 vessels was documented as fishing craft for the first time--13 less than the number reported for the corresponding period of last year. During the first three months of 1956, the Gulf area led all others with 15 newly-documented craft, followed by the Chesapeake area with 12 and the South Atlantic area with 11.

California

AIRPLANE FLIGHTS RESUMED TO STUDY FISH DISTRIBUTION (Flight 56-2): In order to survey the distribution, abundance, and behavior of the important pelagic species found along the coast of California, that State's Department of Fish and Game airplane flights started in 1955 were resumed in 1956. The Beechcraft (4758 N) surveyed the area from Fort Bragg to San Diego, March 2-5, and the Cessna "170" (1359D) covered the area between Sacramento Reef, Lower California, and Point Conception (March 6-17) (see charts). The aerial surveys were conducted along with surface observations made by research vessels and by commercial fishing craft.

Weather conditions were ideal for aerial scouting and only one day of operation was disrupted by fog. During this period fish behavior was erratic and sudden changes in distribution and abundance of fish were observed.

Three school groups of fish were observed along the California coast from March 2-5. These included two small school groups of anchovies, one off Santa Barbara and one off San Diego, and one school group of jack mackerel off Pt. Fermin. From March 11-17 several large school groups of anchovies were observed along the coast from San Diego to Santa Barbara where a week previously very few fish had been seen.

During the last of the flight much time was spent in studying movements and changes in abundance of these large school groups. Depths of the schools were determined by the use of a portable depth-recorder mounted in the life skiff off the Department's research vessel Yellowfin. The observers in the skiff were directed by radio from the observer in the plane and as the skiff passed over a school the surface area of the school was estimated from the air. The depth of the water and the limits in depth of the top and bottom of the fish school were determined from the depth-recorder.

Sampling in daytime met with little success. Only a few fish could be caught by jigging with bare single and treble hooks and Paulas' Lures. A wire frame with treble snag hooks attached proved unsuccessful.

On March 12 biologists aboard the Scripps Institution of Oceanography research vessel Paolina T. were aided by the aircraft in the study of plankton concentrations in and near the areas of fish concentration.

Beechcraft Spotting Flight 56-2, March 2-5, 1956.

The following is a summary of observations on anchovy, jack mackerel, and sardine schools. Included with the aerial observations are data from other sources, such as the commercial and bait catches, M/V Yellowfin sampling, and commercial night-aerial scouting.

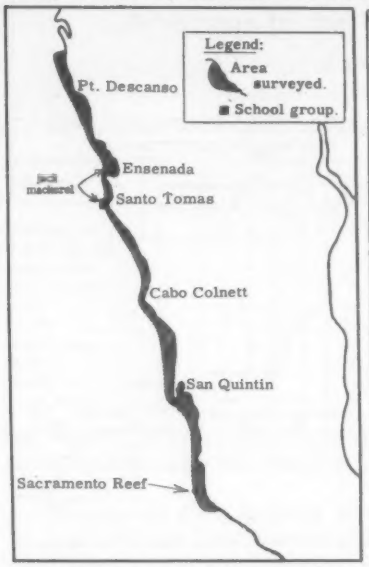
Anchovy: Two large school groups (from 80-132 schools in each school group) appeared close to the beach in the Oceanside and Huntington Beach areas sometime between the 6th and 10th of March. Smaller groups were observed in the San Diego, Santa Barbara, and Santa Monica areas. The large school groups off Huntington Beach and Oceanside remained near the beach for several days, then moved offshore in smaller units near the end of the flight period.

A movement of anchovies into Monterey Bay took place on the night of March 7 when boats scouting at night found large concentrations of fish in the bay where for several weeks previously none had been found.

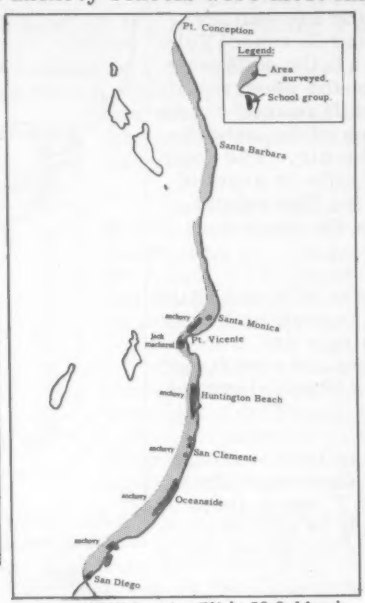
Commercial-catch sampling revealed that the adult anchovies in the Huntington Beach area were nearly all of commercial large size. The anchovies taken commercially in Monterey Bay also were of large size and from preliminary examination were predominately of the 1954-year class. Sampling by the Yellowfin revealed the presence of smaller anchovies off Pt. Vicente. These fish were probably of the 1955-year class. Sampling by the Yellowfin off Oceanside proved that the anchovies in this area were of large size.

In terms of surface area of fish observed by aerial scouting over the past two years, more anchovies were observed during this flight than on any previous flight. More schools of anchovies were observed on the June 1955 flight, but most of the schools seen then were of considerably smaller size than the schools seen during this flight. The size of the anchovies in the schools seen on this flight are much larger than the young fish seen in 1955.

Sardine: No schools which could be positively identified as sardine were observed during the flight. On several occasions off Huntington Beach and Santa Barbara, however, flashes seen in anchovy schools were most likely made by sardines. Night sampling on the Yellowfin revealed the presence of young 1955-year class sardines mixed with the anchovies in both the Oceanside and Huntington Beach areas.



Cessna "170" Spotting Flight 56-2, March 6-10, 1956.



Cessna "170" Spotting Flight 56-2, March 11-17, 1956.

Large adult sardines were located by the commercial fleet off Pt. Fermin and Pt. Vicente. Several large tonnage hauls of pure sardines were reported made by jack mackerel fishermen. These fish were caught by mistake and were released.

Jack Mackerel: A small school group of jack mackerel observed near Santa Tomas, Baja California, was being pursued by the Mexican fishing boats out of Ensenada. It was reported that small amounts of sierra (Scomberomorus) were mixed with the jack mackerel.

The school group of jack mackerel off Pt. Fermin and Pt. Vicente remained in that vicinity for several weeks. Apparently these fish were mostly "night" fish as very few schools could be seen in the daytime. Fair catches of jack mackerel mixed with Pacific mackerel and sardines were being taken sporadically during this period.

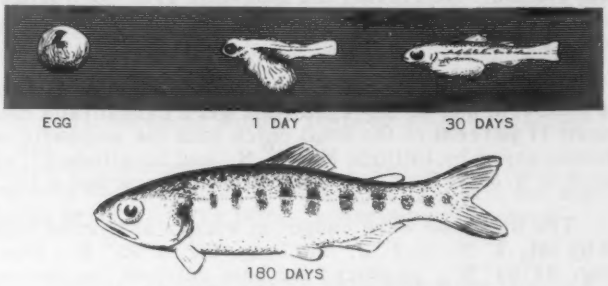
* * * * *

MAJOR NORTHERN CALIFORNIA KING SALMON STREAMS RESTOCKED: More than 3 million king salmon fingerlings were planted recently in three major northern California salmon streams, the California Department of Fish and Game announced April 1956.

Another salmon milestone was the release of the first fingerling king salmon from the new Nimbus Hatchery into the American River. By mid-May 1956 some 3 million fish will have been released from the hatchery. In addition, one million king salmon fingerlings from Coleman Hatchery were released about April 19 into the Mokelumne River in an effort to build up the run in that stream.

During March 2.6 million king salmon fingerlings were released into the Klamath River in Siskiyou County from the Mt. Shasta Hatchery. Eggs from which these fish were hatched were taken at the Fall Creek station.

Another 0.5 million king salmon were released into the Russian River below the site of Coyote Dam, which is expected to create water conditions favorable to this species. At present there are only silver salmon and steelhead trout in the river.



KING SALMON (ONCORHYNCHUS TSHAWYTSCHA)

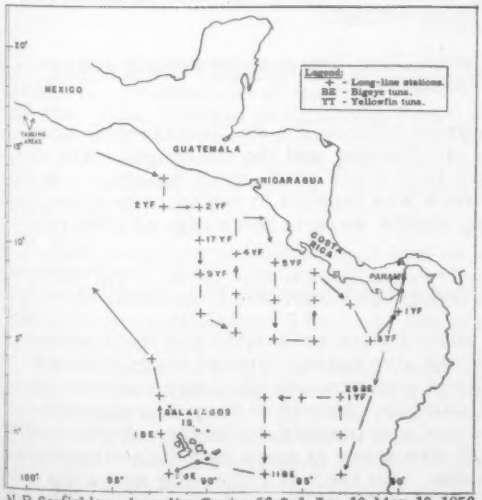
Nimbus Hatchery's first year's production, while far below capacity because of adverse water conditions in 1955/56, will make a definite contribution to the Sacramento River system runs.

The Nimbus Hatchery was constructed by the U. S. Bureau of Reclamation and turned over to California's Fish and Game Department for operation to compensate for loss of natural spawning areas above Nimbus Dam. Operation costs will be borne by the Federal government as a part of the Central Valley Project.

The hatchery, located east of Sacramento, was authorized when the California Fish and Game personnel showed that 70 percent of the entire American River run spawned above Nimbus Dam, which is impassable to migrating fish.

* * * * *

YELLOWFIN AND BIG-EYED TUNA SUBSURFACE DISTRIBUTION SURVEYED (Cruise 56-S-1): The subsurface distribution and relative abundance of yellowfin and big-eyed tuna were surveyed by California's research vessel N. B. Scofield between January 10 and March 10, 1956. This cruise made in South and Central American waters was a seasonal follow up of the cruise made by the same vessel between October-November 1955 (Cruise 55-S-5). Additional objectives of the cruise were to make limited biological and oceanographic observations and collections that may have a bearing on tuna research or other marine life.



N.B. Scofield tuna long-line Cruise 56-S-1, Jan. 10-Mar. 10, 1956.

The M/V N. B. Scofield departed Los Angeles Harbor, January 10, 1956, and proceeded through the first nine scheduled stations. The tenth and eleventh scheduled stations were omitted due to foul weather. Nine more stations were occupied before the vessel arrived at Balboa, Panama Canal Zone, February 9. Departed Balboa, February 12, and occupied remaining 11 stations. A 24-hour stop was made at Santa Maria Island, Galapagos, on February 23. Finished last station February 27, and arrived at Los Angeles Harbor March 10.

Fishing: At each station forty baskets of sardine-baited long-line gear

were set commencing at 0600 hours. Sets were usually completed by 0745 hours. Two depths were fished by using 5- and 15-fathom float lines. Surface trolling was carried on along the long-line set while the gear soaked and while under way for the next station. Retrieving the long-line gear commenced at 1230 hours and was generally completed by 1445 hours. The vessel then proceeded to the next station 120 miles away.

Results: During the cruise 29 long-line stations were occupied, and a total of 44 yellowfin and 43 big-eyed tuna were caught (see chart). Four of the stations produced 77 percent of the total catch with the yellowfin catch concentrated in an area encompassed by latitude 8°-12° N. and longitude 87°-91° W. The heaviest of the catch of 3.89 yellowfin a hundred hooks occurred at lat. 10°04'N. and long. 90°38'W.

The big-eyed were caught at widely-scattered locations in the area encompassed by lat. 2° N. to 2° S. and long. 83° to 92° W. One station at lat. 1°58' N., long. 83°09' W., produced the best catch of the cruise. This station yielded 29 big-eyed and 1 yellowfin for a rate of 6.89 fish a 100 hooks. This was also the only station at which the two species were taken together. Other catches included 122 spearfish, 143 sharks, 57 dolphins, and 6 miscelaneous species.

Surface trolling on long-line stations produced only one small yellowfin. Surface indications of tunalike fishes were observed on two occasions at long-line stations: A school of large yellowfin, observed near the long-line set at lat. 7°58'N., long. 90°37' W., and was thought to have been responsible for the yellowfin catch on that station. Several small schools of frigate mackerel were observed near the long-line set at the station of heaviest catch. The total troll catch consisted of 731 yellowfin tuna, 20 black skipjack, 5 dolphin, 2 bonito, 1 sailfish, and 1 oceanic bonito.

The catches on this cruise were, in general, consistent with those of Cruise 55-S-5 in regard to occurrence of fish. In the number of fish caught, however, there were far fewer big-eyed tuna caught on the latest cruise.

Oceanographic Observations: Bathythermograph casts and surface salinity samples were taken on each station and at 1800, 2100, and 0200 hours while under way between stations. Surface water temperatures were taken at regular intervals both on station and under way. A recording fathometer trace was kept in areas between stations where charts showed few or no soundings.

Positions were computed for each end of the long-line gear at setting and retrieving; these were to be used for drift calculations.

Bathythermograph casts off Central America indicated a shallow thermocline, the shallowest being 30 feet. Thermoclines off Ecuador and the Galapagos were generally deeper and were markedly different than those off Central America. A shoal area with a minimum depth of 405 fathoms was located in the vicinity of lat. 5°38' N., long. 88°26' W. The surrounding depths were in the range of 1500 to 1600 fathoms.

Surface water temperatures in areas fished ranged from 22.7° to 27.6° C.

Biological Activities: All tuna brought aboard were measured and their stomach contents examined. Gonad development was also noted. Several stomachs and ovaries were collected for study ashore. Gonad and stomach examinations were also made of other species brought aboard. Complete records of long-line and troll catches were kept, along with a bridge record of marine-life sightings. A standard oblique plankton tow (450 meters of cable out) was made at each long-line station and at 2100 hours each evening between stations. An hour of collecting with a dip net under a light suspended over the water followed the evening plankton tow. Biological observations included the following:

1. Size composition: A majority of the long-line yellowfin catch was centered about a mode of 100 cm. fork length. Two minor size groups of small and very large fish were also caught.

There were two defined groups comprising the big-eyed catch; averaging 98 cm., and 174 cm.

2. Sexual maturity: Many yellowfin in the 100 cm. group and larger were in a ripe or ripening state of maturity. All big-eyed showed little or no development.

3. Stomach contents: Examination of stomach contents revealed that squid, octopi, and swimming crabs made up the bulk of the food of both yellowfin and big-eyed. Snake mackerel (Gemphylus serpens) were fairly numerous in big-eyed stomachs at two stations.

4. Tagging: Near Acapulco, Mexico, 22 troll-caught yellowfin were tagged and released with spaghetti-type tags.

5. Marine life sightings: Numerous schools of yellowfin tuna were sighted in the vicinity of Cape Corrientes, Mexico. Small scattered schools of skipjack were quite numerous near Cape Mala, Panama. On the night of January 18, 1956, in the vicinity of lat. 15°35' N., long. 94°48' W., a large area of flipping lanternfish (Benthosema pterota) was passed through by the vessel for at least 5 miles and probably more.

In general much more marine life was encountered near shore than in outlying waters.

6. Specimen collections: A variety of marine-life collections was made under the night light, from the stomachs of long-line fish, and during a stop at Santa Maria Island, Galapagos. These collections are in the process of being identified at this time. Larvae of yellowfin and black skipjack taken off Costa Rica have been thus far identified.

Alaska

IMPROVED TRANSPORTATION PROMOTED BY INTERIOR DEPARTMENT: The U. S. Department of the Interior will continue to promote seatrain service to Alaska, in the interest of reducing Territorial transportation costs, even though the new service may cause some change in existing trade channels, Secretary Douglas McKay stated March 20. On the other hand, the Department will not discriminate between rail and motortruck transportation in spite of its ownership of the Alaska Railroad.

For many years, students of Alaska economic problems have pointed to high transportation costs and inadequate service as principal obstacles in the way of developing Alaska's resources. The Department has been doing everything it can to bring those costs down. The proposed trainship is one step in that direction.

In the fall of 1955, rate reductions were made on certain types of quantity shipments on the Alaska Railroad, and this year no increases have been made similar to those granted to the stateside railroads. The Department is sponsoring an action before the Interstate Commerce Commission to eliminate stateside rail-rate discriminations against Alaska, the so-called Export Rate Case.

The trainship service involves provision of roll-on, roll-off car-ferry operation to Alaska on two vessels proposed to be built by a private ocean carrier, the Alaska Steamship Company, provided financing and other arrangements can be made. Whittier was selected as the Alaska terminus in a joint decision of the Alaska Steamship Company and the Alaska Railroad because of the comparatively short haul and moderate grades to Anchorage. The shipping company has guaranteed to continue to serve other Alaska ports, even if the seatrain service is provided.

In discussing truck transportation, it is pointed out that the Department has charge of most highway construction and maintenance in the Territory, through the Alaska Road Commission. The Department has been pleased to note the rapid development of trucking in Alaska during recent years, and intends to continue to foster it in any way possible.

With respect to Alaskan ports competitive with Whittier, the Department has completed a paved highway from Seward to Anchorage, and is fast developing a hard-surfaced network of through roads from Valdez to interior points. In addition, large sums have been expended on rehabilitation of the Alaska Railroad line from Portage to Seward, and on new dock facilities at Seward. With cheaper and better transportation, Alaska will continue to grow in population and wealth as it should.

Cans--Shipments for Fishery Products, January-February 1956

Total shipments of metal cans for fishery products during January-February 1956 amounted to 9,841 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 9,353 tons in January-February 1956. Fish canning in January-February 1956 was confined largely to tuna and oysters, and the increase was principally due to a spurt in tuna packing operations early this year.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Farm Fish Ponds

A one-acre fish pond--well-managed, properly fertilized, and adequately fished--will yield an annual harvest averaging 20 pounds of fish each year and provide 400 hours of good fishing, the U. S. Fish and Wildlife Service announced April 15. In the United States there are more than 1.5 million farm ponds of varying sizes but averaging an acre apiece. Many more ponds are being made each year through soil conservation and water-storage projects.

In 24 states, laws and policies prohibit stocking of farm ponds with fish produced in the state hatcheries. The U. S. Fish and Wildlife Service has been called upon to fill that gap and each year provides more than 30 million fish, mainly warm-water species, for approximately 28,000 noncommercial ponds in 42 States.

Many of these are multipurpose ponds created as part of the Federal Soil Conservation and Watershed Protection program. The fact that the Federal Government and many states furnish the appropriate kind and

Farm fish pond.

number of fish for stocking, plus the knowledge that information on the development and management of ponds is readily available, has greatly stimulated the pond-construction program.

Interest in farm ponds is steadily increasing. The idea, which "took hold" first in the Southeastern States (where almost half the ponds are located) has spread to other sections of the country where topography and climate make these small fishing areas practical. They have a direct value in providing family fishing and at the same time they relieve fishing pressure on natural fishing areas.

Ponds smaller than a half acre rarely furnish good fishing, but ponds of from one to three acres are ideal for the average family and friends. Larger fishing ponds require more management, effort, and expense; however, they do produce a bigger crop of harvestable fish. These large ponds should be opened to public fishing because the quality of the sport is generally improved, never harmed, by heavy recreational fishing. Intensive cropping is an asset in the management of successful fish ponds.

To produce gratifying fishing, a farm pond must be well constructed on a favorable site, properly stocked, and must receive continuing management. Small fishing ponds should be stocked only with hatchery fish of the species, sizes, and numbers recommended for the area by state or Federal biologists. Promiscuous introduction of wild fish, either before or after stocking with the approved hatchery fish, is a common cause of poor fishing.

During 1954 the U. S. Fish and Wildlife Service distributed a total of 46 million eggs and 164 million fish varying from fry to catchable size. Of these 58 million were fry and fingerlings of warm-water species distributed to farm ponds and nearly 1,200 lakes and reservoirs.

Federal Aid to States Increases Gamefish Supply

A permanent additional supply of gamefish amounting to more than 1 million pounds a year has been provided by the manmade lakes created with Federal assistance, the Interior Department announced April 13. U. S. Fish and Wildlife Service experts predict that each of the nearly 8,000 acres of public fishing waters so far completed under the Federal Aid program may be expected to produce at least 150 pounds of game fish annually.

The first Federal Aid lake was completed in 1953, a 32-acre impounded area on Virgin Run, near Pittsburgh, Pa. The latest and largest is Arkansas' Atkin Lake, 652 acres of water backed up behind a dam 2,500 feet in length.

These fishing waters and 79 others like them have been built by the respective States with the help of Federal funds (Dingell-Johnson) made available by the U. S. Fish and Wildlife Service. The fish restoration money involved comes from a Federal excise tax on sport fishing tackle. Since important waterfowl and fur-animal usage is expected to be made of 22 of the lakes, some of the money was made available under the Pittman-Robertson Act which levies an excise tax on sporting arms and ammunition to provide funds for game restoration projects.

The 81 lakes are located in 27 States and represent a total of 7,908 acres of new fishing waters. The cost of these new areas averages from $1,000 to $3,000 per acre of water.

Federal participation in the lake construction program is new. Only nine lakes have been fished for two years and some of them are storing their first water. But the possibilities are clearly indicated by the early returns. On the lake created at Oak Mountain State Park in Alabama, where a dam 825 feet in length impounds 250 acres of fine angling water, 2,308 fishermen caught more than 5,000 pounds of bass and sunfish in three days. On Yellowstone Lake in Wisconsin, where 456 acres of water accommodate thousands of anglers every week, a sample of 226 fishermen shows 1,661 fish in the creel with a catch rate of 3.2 fish per hour. Approximately one-half fish an hour is considered good fishing while an average catch of one fish an hour is considered excellent.

Arizona's Luna Lake, while only 32 acres in extent, has had a terrific economic impact on the adjacent town which has become a hustling meca for anglers.

Of the 81 lakes created to date, 22 are set up for joint use by fish and waterfowl. On the other 59 any waterfowl use is merely incidental. Many of the lakes have other values--but these values are subordinate to the whip of the fly when fishing season is open. No other use is permitted to damage the fishing values of the waters.

Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY THE DEPARTMENT OF DEFENSE, MARCH 1956: A total of 2,198,000 pounds (valued at $1,106,000) of fresh and frozen fishery products for the use of the U. S. Army, Navy, Marine Corps, and Air Force were purchased in March 1956 by the Army Quartermaster Corps. This was 32.5 percent more in quantity and 30.1 percent more in value than purchases the previous month, but 15.7 percent less in quantity and 3.9 percent less in value than purchases in March 1955.

Purchases of Fresh and Frozen Fishery Products by Department of Defense (March and the First 3 Months of 1956 with Comparisons)

QUANTITY				VALUE			
March		Jan.-March		March		Jan.-March	
1956	1955	1956	1955	1956	1955	1956	1955
. . (1,000 Pounds) . . .				. . . . ($1,000). . . .			
2,198	2,606	4,943	6,444	1,106	1,151	2,702	2,765

For the first three months in 1956, purchases of fresh and frozen fish amounted to 4,943,000 pounds (valued at $2,702,000)--a drop of 23.3 percent in quantity and 2.3 percent in value as compared with the same period a year earlier.

Prices paid for these fishery products by the Department of the Defense in March 1956 averaged 50.3 cents a pound as compared with 51.2 cents a pound the previous month and 44.2 cents a pound in March 1955.

In addition to the purchases of fresh and frozen fishery products reported, the Armed Forces generally make some local purchases which are not included in the data given above. Therefore, actual purchases are somewhat higher than indicated, but it is not possible to obtain data on the local purchases made by military installations throughout the country.

Fur-Seal Skins

PRICES DOWN SLIGHTLY AT SPRING AUCTION: Fur-seal skin prices were lower by about 3.2 percent from the 1955 fall sale, but total revenue increased because of a greater volume at the semiannual auction of Government-owned fur-seal skins at St. Louis on April 16, 1956.

A total of 27,017 skins, products of the sealing industry administered by the U. S. Fish and Wildlife Service on the Pribilof Islands, Alaska, brought $2,519,994. This compares with 24,610 skins sold for $2,316,735 at the October 10, 1955, sale. The grand average for all skins sold for the account of the United States Government was $93.27; at the October 1955 sale it was $94.14.

Of the Alaska skins, 16,193 were dyed "matara" (brown), 1,705 were "safari" brown (a lighter brown), and 9,119 were blacks. The matara skins brought an average of $90.58, a decline of 4.8 percent below the October auction. The safari skins sold for an average of $65.90, a decline of 7.6 percent. The black skins averaged $103.18, virtually unchanged from last October's price of $103.46.

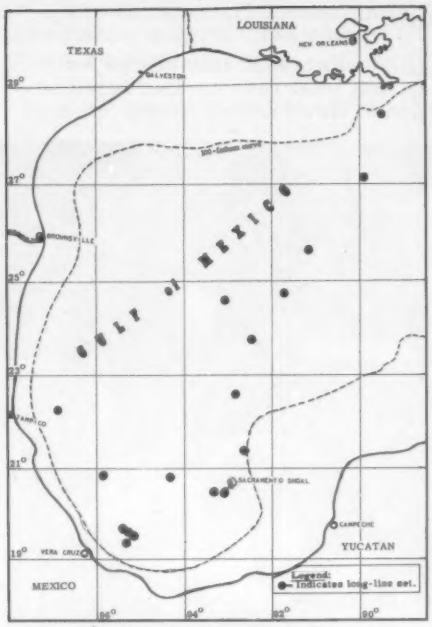
Fur-seal cow and bull with pups in background at U. S. Government Reservation, St. Paul Island, Alaska.

In addition to the United States skins, 4,525 Cape of Good Hope fur-seal skins were sold for the account of the Government of the Union of South Africa at an average of $26.94, a decline of 12.1 percent from the last sale. A total of 450 Uruguay fur-seal skins were sold for the Government or Uruguay at an average of $45.12, a slight increase over last October's price of $44.30.

Gulf Exploratory Fishery Program

LONG-LINE YELLOWFIN TUNA TRIP SUCCESSFUL (Cruise 37): Over 26 tons of yellowfin tuna were caught by the Service's exploratory fishing vessel Oregon on 17 sets averaging 59 baskets (590 hooks) each in the southwestern Gulf of Mexico during cruise 37 (March 22-April 17). Highest catches were made in the southeastern Gulf of Campeche off Sacramento Shoal. An 80- and 91-basket set in this area on April 13 and 14 caught 103 and 117 yellowfin tuna, respectively, with a total weight of 25,431 pounds (12.8 yellowfin/100 hooks). Catch rates on the four sets in other areas of the Gulf of Campeche outside of the 1,000-fathom curve averaged 5.0 yellowfin/100 hooks. The remaining 11 sets were made in the central and southwestern Gulf and caught $4\frac{3}{4}$ tons of yellowfin at an average rate of 1.5 fish/100 hooks.

In addition to the yellowfin catch, 10 bluefin tuna (average weight of 339 lbs.), 1 skipjack, 10 white marlin, 3 blue marlin, 1 swordfish, and 63 sharks were caught; 80 yellowfin, 1 bluefin, 4 white marlin, and the 3 blue marlin were tagged and released. Approximately 13 percent of the yellowfin catch was damaged by sharks.



M/V Oregon long-line Cruise 37.

Most of the sets were made in moderately heavy seas restricting the amount of gear that could be used. All sets caught yellowfin with the exception of one on the northern edge of the Sigsbee Deep. Two large schools of blackfin and one small school of 60- to 70-pound yellowfin were observed during the cruise. Bathythermograms were obtained at the beginning and end of each set.

The Oregon was scheduled to leave Pascagoula on May 1 to carry out three weeks of deep-water shrimp exploration in the north-central and northwestern Gulf of Mexico. The primary objective of this trip was to be to conduct extensive coverage of the 200- to 300-fathom area off the Texas coast using 40-foot flat trawls. If significant quantities of shrimp are located, production-type dragging will be carried out using 80-foot balloon and 100-foot flat trawls.

At the request of several members of the Gulf shrimp industry, a series of exploratory drags will be made for brown-grooved shrimp in depths of 40 to 75 fathoms along the Louisiana and Texas coasts between the Mississippi Delta and Aransas Pass, Tex.

Maine

SARDINE CANNERS PREPARE FOR 1956 SEASON: Most of Maine's 40 sardine canning plants are being put in readiness for the official opening of the season on April 15, but activity will be light until mid-May unless the herring appear earlier than they have for the past 10 years.

Data released by the Maine Sardine Industry's Executive Secretary on April 7 revealed that the average date for a sizable run of fish on any section of the coast for each year since 1945 was May 15. Some activity got under way on May 1 in 1954 and 1955, while it was early June before packing started generally in 1947 and 1948.

Hopes for an early run of fish in eastern Washington County (Eastport area) have diminished somewhat due to the erratic behavior of some large schools that were in evidence for most of the winter.

Sardine boat unloads at a cannery in Maine.

The Industry spokesman said that most companies were eager to start canning as the industry's inventories were at the lowest ebb since the war years. He states: "There is a virtual sell-out of the small 1955 pack of 1,250,000 cases plus the large carry-over from 1954 and most packers are pressed to supply their customers."

Maine Sardines

CANNED STOCKS, APRIL 1, 1956: Distributors' stocks of Maine sardines amounted to 268,000 actual cases as of April 1, 1956; 63,000 cases (or 19 percent) less than on April 1 a year ago. April 1, 1956 stocks were 58,000 cases less than on January 1, 1956, according to estimates based on the results of a series of measurements for the 1955/56 marketing season by the U. S. Bureau of Census.

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, April 1, 1956, with Comparisons

Type of Stocks	Unit	1955/56 Season			1954/55 Season				
		4/1/56	1/1/56	11/1/55	7/1/55	6/1/55	4/1/55	1/1/55	11/1/54
Distributors	1,000 actual cases	268	326	354	235	n.a.	331	n.a.	n.a.
Canners	1,000 standard cases1/	152	475	625	723	575	715	1,239	1,410

1/100 3¼ oz. cans equal one standard case. n.a. - not available.

Canners' stocks as reported by the Maine Sardine Industry amounted to only 152,000 standard cases (100-3¼ oz. cans) on April 1, 1956. Canners' stocks on April 1, 1955, were 715,000 standard cases, and on January 1, 1956, totaled 475,000 cases.

Market Outlook for Fishery Products

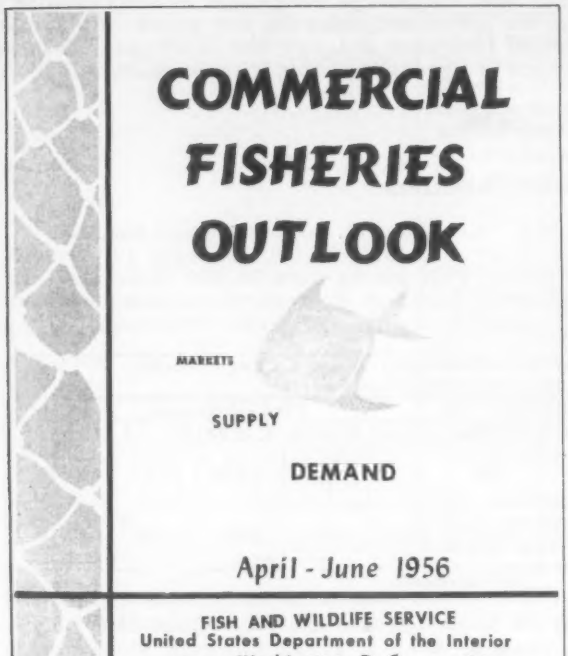
APRIL-JUNE 1956: The fresh fish season is on and for the next six months consumers will have greater freedom of choice between fresh, frozen, and canned fish in markets throughout the country, according to the Commercial Fisheries Outlook, April-June 1956, Fishery Leaflet 336bb, issued by the U. S. Fish and Wildlife Service on April 16.

While some fishing is done in every month of the year, the big harvest begins in the second quarter with several major fisheries reaching peak production during that period.

The North Pacific halibut fishermen begin their season in May and expect to be at peak production by the end of June. Prices probably will be a little higher on the new catch because of light stocks. Salmon are being landed now, but early landings were light as usual for the time of year. The trolling season in Washington and Oregon began April 15. Troll-caught salmon in Alaska find a ready market also.

Good seasonal supplies of fresh mackerel, whiting, bluefish, sea bass, shad, scup, striped bass, mullet, red snapper, and haddock will be available at their usual markets at prices dependent upon local supply situations.

Production of shrimp will also increase with a steady market and good demand expected.



Fresh-water fish landings of bullheads, catfish, buffalofish, carp, smelt, whitefish, yellow pike, and others will be at about the usual level for this time of year. The market for shellfish is generally steady, supplies ample, and demand good.

Cold-storage holdings of salmon are down in the United States and Canada, the demand is good, and prices will probably remain above normal. Canned salmon supplies are practically exhausted and the demand far exceeds the supply. Canning of salmon in Bristol Bay, Alaska, will start June 25.

The tuna industry is getting off to a good start. Domestic landings in the first quarter were nearly twice the landings of the like quarter in 1955 but some of this increase was due to delayed unloadings. Albacore, or white-meat tuna, continues in short supply. However, other kinds of tuna are plentiful. Demand is usually good in the summer.

The Maine sardine packing season began April 15. A better pack is expected than in 1955. Menhaden landings will reach a peak in the South Atlantic and Gulf States area during the quarter and the demand for fish meal and oil is expected to continue strong.

Fish-stick and other packaged fish and shellfish producers will be attempting to expand markets by overcoming price competition which has hampered promotional efforts.

Marketing Prospects for Edible Fishery Products, Spring-Summer 1956

Total supplies of edible fishery products were expected to continue somewhat lower this spring than last, particularly for the canned commodities. Retail prices for fishery products this spring were expected to average a little higher than a year earlier.

Supplies of fresh and frozen fishery products were expected to increase during the summer months as commercial fishing operations expanded seasonally. Total commercial freezings of fish and shellfish probably were expected to reach a peak between late spring and midsummer. Imports of frozen groundfish (including ocean perch) fillets and blocks were expected to continue larger than a year earlier through the summer.

The smaller supplies of canned fishery products this spring than last reflect smaller 1955 packs of salmon and Maine sardines than in 1954. There was no likelihood of much improvement in the canned fish supply situation at least until about midsummer, when the 1956 packs would start moving to market in volume. Except for tuna, the production season for the important canned products is from late spring until about midfall. Tuna is canned the year round. It is still too early to forecast the size of the 1956 canned fish pack because of the great uncertainty as to the availability of fish during the canning season.

Civilian per capita consumption of fishery products this spring and early summer probably would be a little lower than a year earlier. This was expected to reflect mainly the lower supplies and somewhat higher prices in prospect.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the U. S. Fish and Wildlife Service, and published in the former agency's May 1, 1956, release of The National Food Situation (NFS-76).

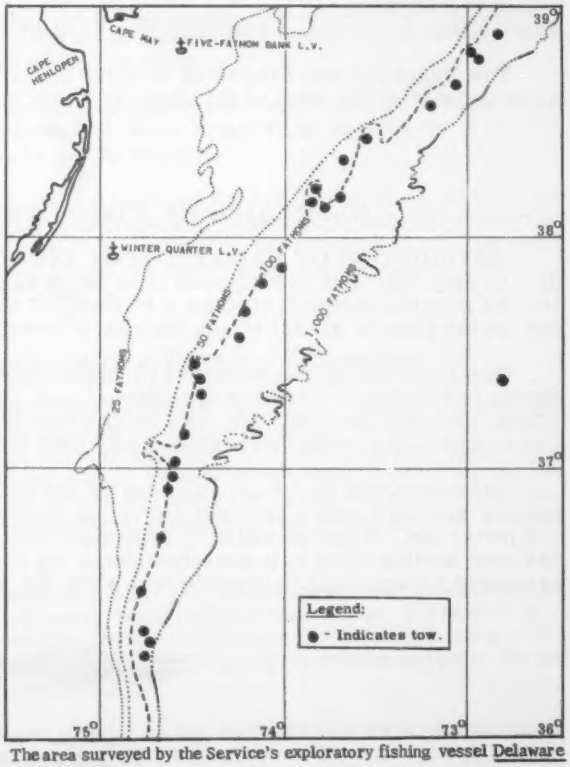
North Atlantic Fisheries Exploration and Gear Research

FISHERIES RESOURCES ON EDGE OF CONTINENTAL SHELF SURVEYED BY "DELAWARE" (Cruise 17): The Service's exploratory fishing vessel Delaware returned on March 30 from a survey of the fishery resources in deep water on the edge of the Continental Shelf offshore from New Jersey to Virginia (see chart). Large schools of spiny dogfish (Squalus acanthias) were encountered on the 11-day trip, with the largest single tow yielding close to 12,000 pounds.

Common lobsters (Homarus americanus) were found to be widely distributed over the area surveyed, but were not caught in large quantities. Other varieties taken during the trip included the deep-water red crab (Geryon sp.), white hake (Urophysis tenuis), and whiting (Merluccius sp.)

The vessel made 27 tows with a standard No. 41 otter trawl equipped with 20-fathom ground cables and 45 feet of rollers. All tows were of one hour duration; 1½ days were lost due to stormy weather.

The Delaware is scheduled to leave its East Boston base on April 9 to continue the survey of the deep-water fishery resources on



The area surveyed by the Service's exploratory fishing vessel Delaware (Cruise 17).

the edge of the Continental Shelf. The area to be surveyed will be near the Grand Banks, south of Newfoundland.

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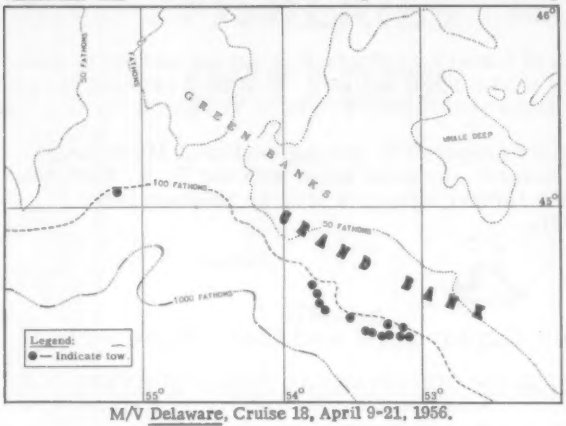
OCEAN PERCH EXPLORATORY FISHING ON GRAND BANK BY "DELAWARE" (Cruise 18): A total of 25,724 pounds of ocean perch (Sebastes marinus) was taken on the western edge of Grand Bank during Cruise 18 of the Service's exploratory fishing vessel Delaware. The fish was taken in the 150- to 400-fathom depth range, with the largest single one-hour catch amounting to 5,052 pounds. Contrary to expectations, the ocean perch taken were of very small size, ranging from 0.6 to 1.1 pounds in weight. Previous cruises in the Sable Island area, to the westward, had yielded ocean perch two to three times as large from deep water.



M/V Delaware, Cruise 18, April 9-21, 1956.

High wind and snow permitted completion of only 14 tows in deep water during the 13-day cruise, which ended April 21. A standard No. 41 otter trawl was used.

The Delaware was scheduled to leave April 30 to continue exploration for deep-water lobster at the edge of the continental shelf.

North Atlantic Fisheries Investigations

DISTRIBUTION OF HADDOCK EGGS AND LARVAE STUDIED BY "ALBATROSS III" (Cruise 72): The distribution of haddock eggs, larvae, temperature and salinity, and the general circulation pattern in the Gulf of Maine were studied during a ten-day cruise (March 21-31) by the Service's research vessel Albatross III.

The 2,000 miles of continuous plankton tows at the surface and at ten-meter depths resulted in the finding of haddock, cod, gray sole, and sea dab eggs. In addition, herring, cod, pollock, and ammodytes (sand launce) larvae were found. The haddock eggs were found principally over the southeast part of Georges Bank.

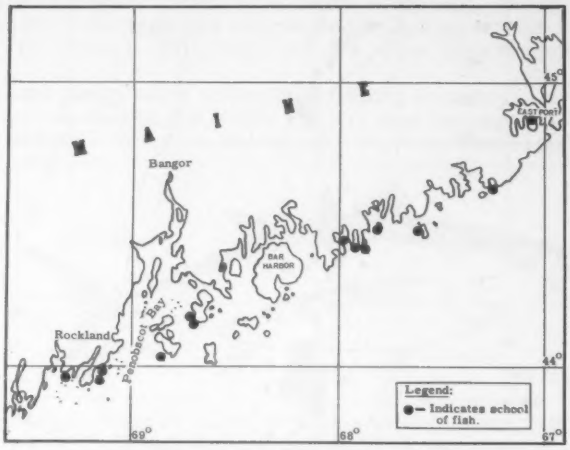
Oceanographic data was collected by 190 bathythermograph lowerings and 90 salinity samples, and additional biological data by 14 surface tows with the standard meter net. Eight samples of eggs were hatched for identification purposes and 624 drift bottles were released throughout the area of the cruise. The surface temperatures encountered during the trip were the lowest in recent years.

North Atlantic Herring Research

AERIAL SURVEYS OF MAINE HERRING SCHOOLS STARTED (Flight No. 1): An aerial survey was made by the U. S. Fish & Wildlife Service of coastal waters from Eastport, Me., to Muscongus Bay. All bays, rivers, and inlets were thoroughly covered. The objectives of this survey were as follows:

1. Locate any schools of herring present along the coast.

2. Evaluate the possibilities of this method of surveying as an aid to the research program on herring.



Airplane Spotting Flight No. 1 for Maine herring.

The aircraft used was a four-place Cessna 172. The survey was made in two flights from the Bar Harbor Airport. The first flight was from Bar Harbor to Eastport and return, and the second flight was from Bar Harbor to Muscongus Bay and return. It was planned to cover the coast from Muscongus Bay to Portland on a third flight, but unfavorable weather prevented this. Movies and still pictures were made of the various methods of constructing and locating herring weirs along the coast.

Observable indications of fish schools in the water were noted at several localities shown on the accompanying chart which were believed to be schools of herring. However, positive identification could not be made.

Survey plans for 1956 call for the use of a seaplane for herring spotting, both in cooperation with a Service surface fishing vessel and to assess the availability of herring in the inshore areas and to note the major school-group movements in the fishery.

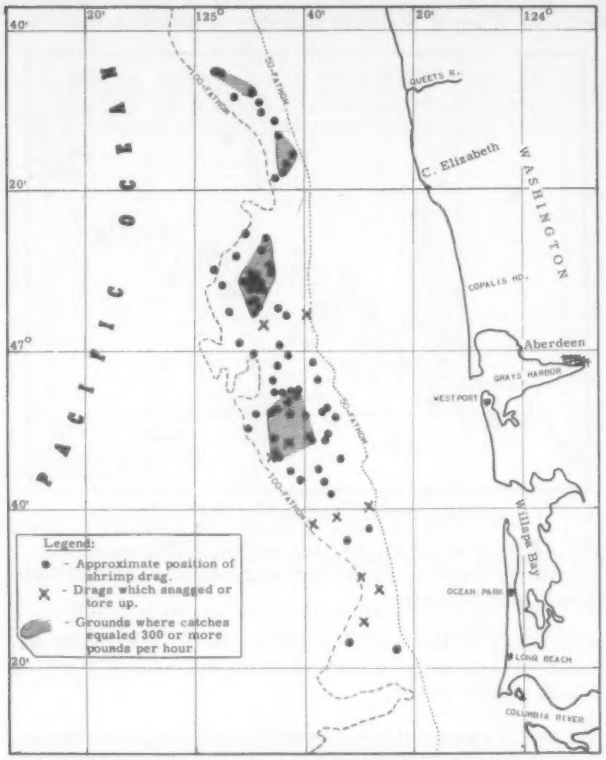
North Pacific Exploratory Fishery Program

GOOD PINK SHRIMP CATCHES REPORTED BY "JOHN N. COBB" (Cruise 26): Good catches of "cocktail-size" pink shrimp (Pandalus jordani) were made off the coast of Washington by the Service's exploratory fishing vessel John N. Cobb during a four-week cruise which ended on April 20. Best fishing areas yielded shrimp at the rate of 2,000 pounds per hour off Grays Harbor, and fairly consistent catches of 500 pounds or more per hour were made in several areas with a Gulf of Mexico shrimp trawl.

This was the second shrimp exploration off the Washington coast conducted by the Service in cooperation with the State of Washington Department of Fisheries. The first trip in the fall of 1955 revealed that the shrimp beds extended over a wide area from off Willapa Bay to off Cape Johnson principally at depths between 50 and 100 fathoms.

The second trip showed excellent prospects for development of a commercial shrimp fishery off the Grays Harbor area. Most productive depths were from 65

to 85 fathoms both north and south of the entrance to Grays Harbor on green mud bottom. In order to test commercial possibilities in one of the better areas, the John N. Cobb made a series of "production" drags over a 6-hour period approximately 26 miles true west of Copalis Head on April 18. From 6 a.m. to noon, seven 30-minute drags at 74 to 79 fathoms produced a total of 5,210 pounds of shrimp. Random samples from these catches ranged from 110 to 122 whole (heads-on) shrimp a pound.



M/V John N. Cobb, Cruise No. 26 (March-April 1956).

A total of 94 drags, mostly of one-hour duration, were completed during the trip at depths of 48 to 138 fathoms from off Long Beach to Destruction Island: 51 drags were made with a 40-foot Gulf of Mexico shrimp trawl having a 1½-inch mesh cod end, 39 with a 20-foot beam trawl, and 4 with a small-mesh Western otter trawl.

The Gulf shrimp trawl, used for the first time in this region as far as is known, proved to be from two to three times as efficient as the beam trawl. The gear caught only small amounts of fish, mostly species not considered as food fish, such as skates, ratfish, turbot, etc. The Gulf trawl was fished from one trawling cable on a 25-fathom bridle, a method easily adaptable to small commercial vessels in the 50- to 60-foot class.

Night fishing on two different occasions resulted in very small catches on identical grounds where good shrimp catches were made during the day.

An experiment in holding the fresh whole pink shrimp on ice was carried out aboard the John N. Cobb over a 6-day period. Although final technological tests are not yet completed, preliminary examination indicates that the shrimp can be held several days on ice with no apparent damage to the meat. The fresh shrimp peeled easily after being held in ice at least 24 hours.

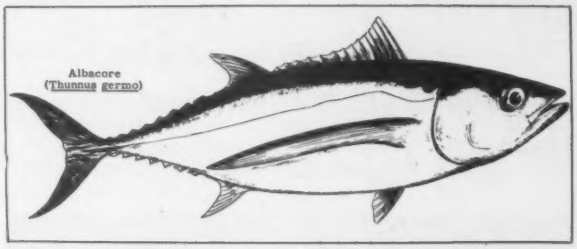
A biologist from the Shellfish Division of the Washington State Department of Fisheries participated in the cruise, and numerous samples of shrimp were frozen for biological analysis at the State laboratory at Aberdeen.

One commercial vessel out of Westport started to fish the shrimp grounds and had boated several catches before the John N. Cobb left the area.

Pacific Oceanic Fishery Investigations

TAGGED ALBACORE TUNA RECAPTURED AFTER LONG MIGRATION: The fact that albacore tuna range over vast distances in the Pacific was proven by the recapture of a 40-pound albacore tuna tagged 1,300 miles north of Hawaii, October 5, 1954, by the U. S. Fish and Wildlife Service and recaptured in January 1956 near Japan, 2,370 miles away. The albacore tuna weighed 15 pounds when tagged.

The recovery may be of extreme importance to the tuna fishing industry. It is additional evidence that the albacore tuna of the North Pacific may belong to a single population which migrates between America and Japan. It is not conclusive, however, because this is only the second instance in which an American tagged albacore has been taken in Japanese waters. The first such instance was about three years ago when an albacore tagged off the California coast was taken near Tokyo.



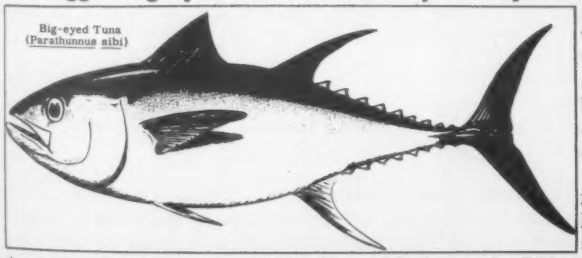
It was also reported that another tagged tuna had been recaptured. This one, a 7-pound skipjack, tagged close to the Hawaiian shore was taken 252 days later only 30 miles away. It had doubled in weight in the interim.

The tuna migration study is one of many being conducted by the Pacific Oceanic Fishery Investigations unit of the U. S. Fish and Wildlife Service. Its purpose is to find out as much as possible about the life history of the fish so as to be able to predict abundance, probable best fishing seasons and locations, and to get other information which will aid the industry to develop new high-seas fisheries.

Fishing for the albacore, which has the whitest meat of all tunas, is a valuable segment of the tuna industry. However, its variations in time and place of appearance along the North American coast presents commercial albacore fishermen with more than the usual number of problems. There are several thousand tagged albacore in the Pacific Ocean now and Service scientists hope that tuna migrations will be clearly defined in the future.

* * * * *

SECOND TAGGED BIG-EYED TUNA RECAPTURED: The recapture of a second tagged big-eyed tuna was made by the Japanese long-liner Shoyu Maru on February 3, 1956, near 25° N. latitude and 177° E. longitude. The tuna was one of three fish tagged and released on January 31, 1955, by one of the Pacific Oceanic Fishery Investigations research vessels at 30°59' N. latitude and 171°14' W. longitude (about 400 miles NE. of Midway Island). During the course of the 12 months and three days that the big-eyed tuna was in the water, it had traveled nearly 750 miles in a southwesterly direction and gained 35 pounds in weight. The first recovery (also tagged on January 31, 1955) was made by the Japanese long-liner Nikkon Maru on November 24, 1955, about 800 miles east of the release point and the fish had gained about 10 pounds in weight.



Note: See Commercial Fisheries Review, February 1956, p. 25.

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STUDY OF LONG-LINE SHARK CATCH COMPLETED: A study of the catch per unit of effort for long-line-caught sharks made during cruises of the Pacific Oceanic Fishery Investigations research vessels was completed in March 1956. The analysis of the data, seasonally and geographically, indicates that of the six species captured most frequently, two (the white-tip and brown) are equatorial and moderately abundant, one (the bonito shark) is wide-ranging but uncommon, another (the great blue shark) is wide-ranging and very abundant in cold water, a fifth (mackerel shark) is limited to cold water, while a sixth variety (thresher shark) may have longitudinal restrictions.

Public Eating Places Survey

MENU PRICES FOR DINNERS IN PUBLIC EATING PLACES: In almost two-thirds of United States public eating places serving fish and shellfish, the dinners bought most often cost less than one dollar. This fact will be of interest to fish distributors who may note that restaurants customarily don't spend more than 20 percent of the plate or menu price for the major ingredient. About 22 percent of the establishments indicated that the dinners they sold most often were priced between $1 and $2. Relatively few (less than 8 percent) of the establishments sold more dinners priced at $2 or over than any other price category. These figures are based on a scientific sample survey of approximately 4,500 public eating places. For the nation as a whole, 65 percent of the restaurants as compared with 91 percent of the cafeterias sell dinners of less than $1 more often than dinners of over $1.

For hotels which operate restaurants and cafeterias, the most frequent price of the dinner bought was between $2 to $4. This price category for dinners was reported by 41 percent of the hotel eating places as compared to a national average of 7 percent of all the establishments.

Regionally, the distribution of responses as to the price of dinner bought most often varies only slightly except in the West. The West, when compared with the other regions, included proportionately more restaurants and cafeterias which sold the higher-priced dinners between $1 and $4.

Public eating places when grouped by annual dollar sales showed an interesting relationship between annual sales and the number of eating places serving higher-priced dinners. Restaurants and cafeterias in the higher annual sales bracket reported the expensive dinners more often.

This study on the consumer's cost of dinners bought most often is one part of a broader study of fish and shellfish consumption characteristics in public eating

places. The Fish and Wildlife Service contracted with the Bureau of the Census to conduct the survey with funds provided by the Saltonstall-Kennedy Act of 1954.

Percentage of Public Eating Places Serving Fish and Shellfish in the United States by Menu Price of Dinners Bought Most Often

	Total		Menu Cost of Dinners						
			Less Than $1	$1-$2	$2-$4	Over $4	More Than One Dining Facility	No Dinners Served	No Answer
	No.	%	%	%	%	%	%	%	%
United States total	208,100	100.0	62.3	21.9	7.1	0.5	0.8	5.4	2.0
Region:									
Northeast	68,000	100.0	62.0	22.1	8.7	0.7	1.0	4.0	1.5
North Central	59,700	100.0	66.5	19.4	5.9	0.2	0.5	4.7	2.8
South	45,900	100.0	67.3	19.1	3.7	0.4	0.4	7.6	1.5
West	34,500	100.0	49.0	29.9	10.7	0.9	1.2	6.3	2.0
Type of Establishment:									
Restaurants	105,700	100.0	65.5	26.5	6.2	0.6	0.2	0.4	0.6
Cafeterias	4,300	100.0	90.7	7.0	-	-	-	2.3	-
Restaurants or cafeterias in hotels	15,300	100.0	13.7	30.7	41.2	2.6	7.2	2.0	2.6
Drug or proprietary stores with fountain	9,800	100.0	81.6	3.1	-	-	2.0	8.2	5.1
Other1/	73,000	100.0	63.8	16.8	2.6	0.1	0.1	13.0	3.6
City Size--Population:									
500,000 or more	42,600	100.0	64.8	18.8	8.7	1.4	1.6	2.1	2.6
100,000 to 499,999	26,100	100.0	71.3	11.5	6.9	0.4	2.3	3.8	3.8
25,000 to 99,999	27,400	100.0	65.0	17.5	6.6	0.7	0.4	9.5	0.3
2,500 to 24,999	39,900	100.0	65.2	24.6	3.5	-	0.2	4.5	2.0
Less than 2,500	72,100	100.0	55.1	27.7	8.5	0.3	0.1	6.8	1.5
Annual Sales:									
$100,000 or more	15,200	100.0	22.4	30.3	37.5	3.9	4.6	1.3	-
$40,000 to $99,999	24,800	100.0	48.8	33.9	11.3	0.8	0.4	3.6	1.2
$10,000 to $39,999	62,600	100.0	68.7	22.8	4.6	0.2	0.3	1.6	1.8
Less than $10,000	91,600	100.0	69.3	17.0	2.6	-	0.5	8.6	2.0
No reply	13,900	100.0	55.4	19.4	7.2	1.4	1.4	8.7	6.5

1/ Includes drinking places, lunch counters, and refreshment stands.

Note: The data are a projection based on the probability sampling of 4,500 public eating places.

Note: Also see Commercial Fisheries Review, February 1956, pp. 31-33.

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POPULARITY OF FISH AND SHELLFISH IN PUBLIC EATING PLACES: Canned tuna was found to be the most popular fish in restaurants, cafeterias, and other public eating places in the United States and shrimp the most popular shellfish.

According to the recent U. S. Fish and Wildlife Service sample survey, tuna was served as the most popular species in 43,000 establishments out of 190,000 serving fish. Halibut vied with flounder for second place, while haddock, salmon, cod, ocean perch, pike, and catfish followed in popularity in the order given.

Shrimp was sold as the most popular shellfish in 112,000, or over 80 percent, of the 134,000 public eating places serving shellfish. Oysters were next in sales with scallops and lobsters a close third and fourth. Crabs and clams followed in fifth and sixth place.

The findings mentioned are based on a statistical sample of the number of establishments reporting their three most-often-sold species of fish and their three leading species of shellfish.

Ranking of the More Popular Species Sold in Public Eating Places Serving Fish and Shellfish, by Region, 1955 1/

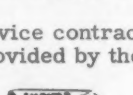
Species	United States	Northeast	North Central	South 2/	West 2/
Fish:					
Tuna	1	1	9	10	3
Flounder	2	2	-	3	4
Halibut	3	4	8	-	1
Haddock	4	3	3	6	-
Salmon	5	5	7	9	2
Cod	6	6	6	4	5
Ocean perch	7	-	1	8	-
Pike	8	8	2	-	-
Catfish	9	-	4	1	-
Swordfish	10	7	-	-	9
Yellow perch	11	-	5	-	-
Sea bass	12	-	-	6	7
Sea trout	13	-	-	2	-
Whitefish	14	-	10	-	-
Red snapper	15	-	-	7	-
Fish sticks 3/	16	-	-	-	10
Lake trout	17	-	11	-	-
Scup	18	9	-	-	-
Whiting (Jack salmon)	19	-	-	13	-
Sardines	20	10	-	-	-
Brook trout	21	-	-	-	6
Spanish mackerel	22	-	-	12	-
Bluefish	23	11	-	-	-
Shellfish:					
Shrimp	1	1	1	1	1
Oysters	2	6	2	2	2
Scallops	3	2	4	5	5
Lobsters	4	3	3	4	4
Crabs	5	5	-	3	3
Clams	6	4	-	-	6
Abalone	7	-	-	-	7

1/ Ranking is based on total number of establishments reporting a species most often sold as either first, second, or third choice.
2/ Mullet ranked 11th in the South; rock cod ranked 8th in the West.
3/ Includes more than one species of fish.
Note: The data are a projection based on the probability sampling of 4,500 public eating places.

Differences in the rankings of the species of fish on a regional basis are most striking. Tuna ranked first in the Northeast region, but dropped to ninth, tenth, and third place in the North Central, South, and Western regions, respectively. The more frequent sale of tuna in the Northeast region may be due to the larger proportion of drug stores, drinking places, lunch counters, and refreshment stands which normally serve tuna in salads and sandwiches. Flounder ranked second, third, and fourth in the Northeast, South, and West, respectively, but was insignificant in the North Central region. Halibut ranked first in the West and fourth and eighth in the Northeast and North Central, respectively, but was not among the leaders in the South. Haddock was in third place in the Northeast and North Central, sixth in the South, but was not ranked among the leaders in the West. Salmon was second in the West and fifth, seventh, and ninth in the Northeast, North Central, and South, respectively. The ranking of cod was more uniform. It ranked fourth in the South, fifth in the West, and sixth in both the Northeast and North Central.

Shrimp outdistanced by a wide margin all other species of shellfish in the four regions in popularity. Oysters are the second most-often-sold shellfish in the North Central, South, and West, but, oddly enough, in sixth place in the Northeast. Scallops ranked second in the Northeast, fourth in the North Central, and fifth in both the South and West. Lobsters ranked third in the Northeast and North Central and fourth in the South and West. Crabs claimed third place in the South and West, fifth in the Northeast, and unranked in the North Central.

The U. S. Fish and Wildlife Service contracted with the Bureau of the Census to conduct the survey with funds provided by the Saltonstall-Kennedy Act of 1954.



Saltonstall-Kennedy Act Fisheries Projects

EFFECT OF LOGGING AND SEA LIONS AND HAIR SEALS ON ALASKA FISHERIES TO BE STUDIED: The effect which Alaska's new industry, logging for pulp production, will have upon its old industry, salmon fishing, will be the object of a special study, the Acting Secretary of the Interior announced March 22. The study will be made by the Fisheries Research Institute of the University of Washington under a contract signed by the U. S. Fish and Wildlife Service. The one-year contract provides for an expenditure of $35,000.

It was also announced that the Fisheries Research Institute would make a study of the effect of Alaska sea lions and hair seals on the salmon and halibut fisheries. This contract is for $20,000 and provides for a year's study.

Large-scale logging operations in the huge stands of virgin timber in Alaska are just beginning and the Service is concerned about any possible damage to salmon streams. As a result, the Service is seeking ways to protect the fishery against harmful effects which might occur. A field station is being established near Ketchikan and detailed observations will be made of biological and physical changes resulting from the logging. Of particular interest will be the extent of silting in the stream bed and any changes in salmon runs and the success of spawning.

Sea lions on breeding grounds about 2 weeks after height of breeding season.

The damaging effect which the big sea lions and the hair seals have upon fishing gear in those northern waters is well known to the fishing industry, but the general effects on fisheries have not been measured. For some time these animals have been considered serious predators on salmon and halibut, but to what extent is not known. The U. S. Fish and Wildlife Service is asking that special attention be given to the locations of the rookeries of these animals, the total populations, the trend in populations, and the food habits. The results of this study will be related to the findings of other studies on hair seal and sea lions made by the Institute.

These research projects are financed by the Saltonstall-Kennedy Act of 1954 which provides for the development of fisheries and markets for fishery products.

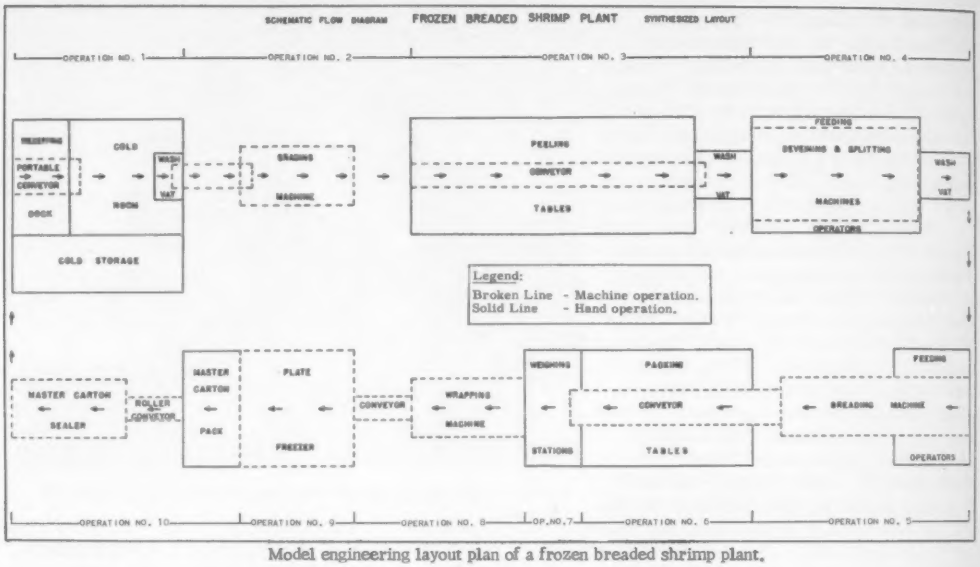
Shrimp

BREADED SHRIMP PLANT ENGINEERING SURVEY: Considerable savings in breaded shrimp production costs may be made by reorganizing plant layout using the existing facilities, according to a plant engineering survey in Florida and Georgia, made by the First Research Corporation of Miami, Fla., under the supervision of the U. S. Fish and Wildlife Service. The survey was financed by funds provided by the Saltonstall-Kennedy Act of 1954 to help the domestic fishing industry.

In a study of typical shrimp breading and freezing plants in Florida and Georgia, the plant engineering specialists found that all of the plants may have an opportunity to cut production costs by certain improvements in the arrangement of existing plant equipment. Almost without exception, rearrangement of the plant layout within the space available could offer labor savings through the reduction of transport which was considered excessive in some cases.

The man-hours expended in various operations were measured and compared by the engineers. A synthesized plan for a plant layout was developed for maximum efficiency using equipment and machinery in common use in the industry.

This plan may be adjusted to the particular needs of the individual enterprise. In many cases the adoption of only some phase of the synthesized layout plan may offer real savings in man-hour costs.



Model engineering layout plan of a frozen breaded shrimp plant.

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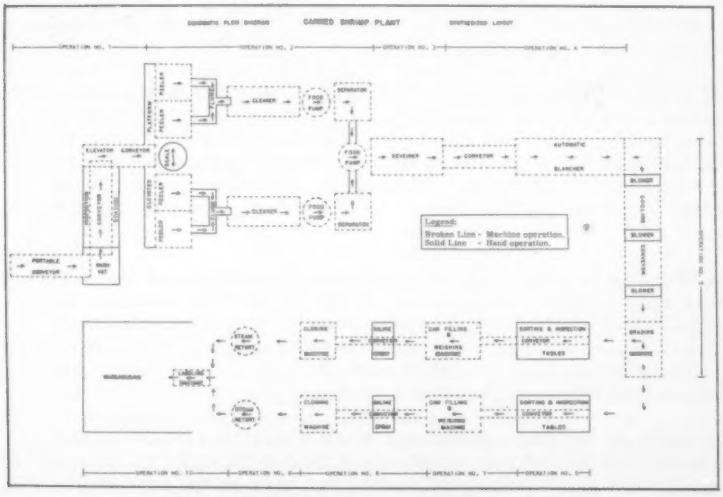
SHRIMP CANNERY COST-CUTTING OPPORTUNITIES: Canned shrimp plants are the most highly mechanized segment of the shrimp industry. Nevertheless, it is reported that about 85 percent of the total man-hours required to pack canned shrimp consist of hand operations. Opportunities may exist in the shrimp canneries to cut labor costs by saving man-hour losses created by crossover and backtracking in product flow, according to a survey made in Louisiana by industrial engineers of the First Research Corporation, Miami, Fla., under the supervision of the U. S. Fish and Wildlife Service. The survey was financed by funds provided by the Saltonstall-Kennedy Act of 1954.



Model engineering layout plant of a canned shrimp plant.

Shrimp canners use proven machinery wherever possible in the production line, but recognize the need

for further refinement of their mechanized equipment, according to the engineers of the First Research Corporation. The automatic peeling machines and automatic deveining machines introduced in recent years have greatly reduced manpower requirements. However, satisfactory machinery to perform sorting and inspection operations may be needed.

In connection with the survey, the industrial engineers developed a cannery layout plan for maximum efficiency using equipment and machinery now in common use in the industry. In many cases, the adoption of only some phase of the synthesized layout plan may offer real savings in man-hour costs.

A detailed description of the advantages of the model plan is available from the U. S. Fish and Wildlife Service, Washington, D. C.

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STUDY OF FUEL CONSUMPTION BY GULF SHRIMP FLEET: Fuel consumption is one of the leading cost factors in vessel operation. Moreover, as compared with such fixed expenses as insurance, depreciation, licenses, and interest charges, it is one of the few costs over which vessel operators have some degree of control. Fuel consumption for five shrimp vessels based in Key West and fishing the Tortugas grounds in 1954 ranged from 57.4 gallons of Diesel fuel per day to 76.2 gallons. However, the same figures expressed in terms of the vessel's shrimp catch ranged only from 0.32 gallons per pound of shrimp caught to 0.37 gallons per pound.

Typical offshore trawlers tied to the dock at Morgan City, La.

The figures for Brownsville, Tex., expressed in terms of shrimp catch ranged from 0.3 gallons per pound of shrimp caught to 0.48 gallons. The fuel consumption for Biloxi, Miss., expressed in terms of the vessel's shrimp catch ranged from 0.22 gallons per pound of shrimp caught to 0.29 gallons.

Fuel Consumption On Shrimp Vessels: Annual, Per Day, and Per Pound of Shrimp Caught, 1954

Vessel	Tonnage		Dimensions in Feet			Year Built	Engine		Net		Jan.-Dec. 1954 Gallons of Fuel			Fishing Grounds
	Gross	Net	Length	Breadth	Depth		Type	hp.	Size	Type	Total	Per Day	Per Lb. of Shrimp Caught	
Key West, Florida														
A	26	11	44.8	16.0	6.3	1946	D.	165	62'	SB.	16,679	76.2	.37	Tortugas
B	22	8	41.1	14.2	5.9	1948	D.	110	62'	SB.	12,413	57.4	.35	
C	28	11	46.1	16.2	5.4	1943	D.	100	62'	SB.	14,792	65.4	.35	
D	21	8	41.8	14.7	6.3	1947	G.	165	62'	SB.	12,254	61.9	.33	
E	48	33	52.8	15.9	8.3	1953	D.	165	65'	SB.	15,887	68.7		
F	65	29	61.6	18.4	8.4	1953	D.	165	65'	SB.	9,430	134.8	1/.32	Campeche
G	63	28	58.7	18.5	8.2	1952	D.	120	65'	SB.	8,602	108.8	1/.28	
Biloxi, Mississippi														
H	18	11	42.5	14.3	4.4	1944	D.	110	55'	B.	12,481	51.8	.29	Delta
I	49	33	57.1	17.6	6.4	1943	D.	120	64'	B.	16,032	61.2	.28	
J	22	14	48.2	15.7	4.3	1942	D.	77	52'	B.	10,780	42.4	.23	
K	16	10	42.9	14.3	4.5	1945	D.	83	56'	B.	8,551	41.9	.22	
Brownsville, Texas														
L	53	23	59.9	18.5	6.9	1951	D.	120	86'	F.	25,717	137.9	.48	Off Brownsville
M	57	25	54.2	18.9	8.2	1950	D.	120	86'	F.	27,458	131.4	.43	
N	57	23	59.5	17.9	7.7	1951	D.	120	86'	F.	27,822	115.9	.33	
O	57	23	59.5	17.9	7.7	1951	D.	120	86'	F.	24,233	114.3	.30	
P	72	35	64.8	19.7	7.4	1952	D.	170	86'	F.	31,198	125.3	.30	
Q 2/	73	34	66.9	19.0	9.2	1954	D.	330	110'	F.	17,000	204.8	1/.41	

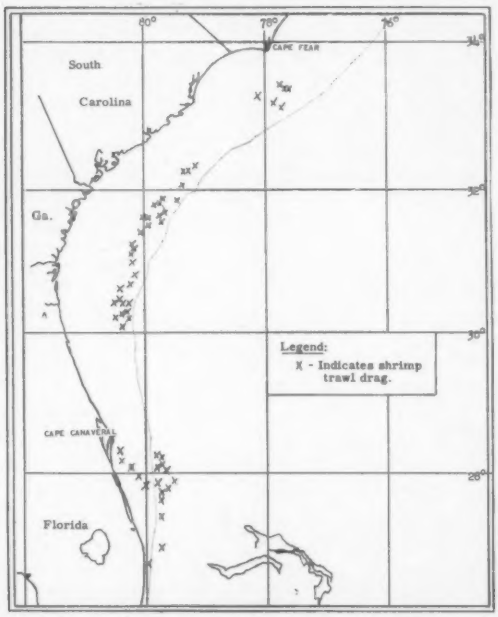
1/ September through December only. 2/ Steel. SB. - Semi balloon, B. - Balloon, F. - Flat, D. - Diesel, G. - Gas.

A rule-of-thumb method of fuel efficiency appraisal for a vessel operator is derived by dividing his annual catch by his annual fuel purchases. The table shows the results for vessels shrimping in the areas mentioned by various tonnages, dimensions, engine power, and by type and size of net. By selecting a vessel with about the same characteristics, an operator can estimate approximately his vessel's fuel consumption rate in relation to others in the shrimping industry. Such a comparison must, of course, take into consideration equal distances to fishing grounds.

The fuel consumption study is one phase of the vessel efficiency study made by a contractor under the supervision of the U. S. Fish and Wildlife Service. The data are a part of a study to investigate important features of vessel design and construction, vessel productivity, and efficiency of navigational and fishing aids. The study was financed by funds made available by the Saltonstall-Kennedy Act of 1954 to help the domestic fishing industry.

South Atlantic Exploratory Fishery Program

EXPLORATORY SHRIMP CRUISES IN SOUTH ATLANTIC, MARCH 1956: Pelican (Cruise 1): The deep-water trawling phase of the Service's South Atlantic exploratory fishery program was initiated by the Pelican, a vessel chartered by the U. S. Fish and Wildlife Service. In a series of 15 deep-water trawling stations off Ft. Pierce and Cape Canaveral, Fla., using a 40-foot flat shrimp trawls and a 10-foot beam trawl, large deep-water red shrimp (Hymenopenaeus robustus) were caught in all drags between 180 and 235 fathoms. Catches of shrimp ran from 5 to 20 pounds per 2-hour drag. A 4½-hour drag off Cape Canaveral using an 80-foot balloon trawl caught 125 pounds of red shrimp of mixed sizes, averaging 26-30 count heads off. Numerous problems were encountered in trying to trawl in the strong Gulf Stream current. Attempts to tow against or across the current were unsuccessful. Excellent trawling bottom was found between Ft. Pierce and Cape Canaveral, but on a drag southeast of Ft. Pierce the trawl hung up on a rock "ledge" and the vessel almost capsized before the trawling warp parted.



Shrimp Trawling Stations. M/V George M. Bowers (Cruise 2) and the M/V Pelican (Cruise 1) during March 1956.

A series of 5 drags were made in depths of 21 to 80 fathoms between Lake Worth and Cape Canaveral. One pound of 10-count mixed brown shrimp (Penaeus aztecus) and pink shrimp (P. duorarum) were caught in one-hour day and night drags in 21 fathoms southeast of Cape Canaveral.

George M. Bowers (Cruise 2): Exploration of the continental shelf area was continued during cruise 2 of the Service's George M. Bowers (March 6 to 25). Work during this period extended from St. Augustine to Wilmington, N.C. A total of 37 one-hour drags using a 40-foot flat trawl were made in depths of 14 to 45 fathoms.

Commercial shrimp species were caught in only two of these drags. Three individual brown shrimp were caught in 22 fathoms off Savannah, and $3\frac{1}{2}$ pounds of 10-count brown shrimp were caught in a one-hour drag in 40 fathoms off St. Augustine. Two 80-foot balloon trawl drags in this area were unsuccessful in reaching the bottom and fishing operations were discontinued due to bad weather.

Small quantities of rock shrimp (Sicyonia brevirostris) were caught in 17 of the 18 night drags and in 6 of the 15-day drags. Best catches ran about 15 pounds per hour.

Two species of commercially-valuable flounders were caught in most of the drags. Paralichthys dentatus (summer flounders), averaging $\frac{3}{4}$ of a pound, and P. albigutta (sand flounder), averaging about 1 pound, were caught at rates of 2 to 80 pounds per hour. In general, nonutilized fish catches at all stations were small with the exception of one drag at 31° 42.5' N. lat., 79° 37' W. long., in 36 fathoms, that caught 1,365 pounds of spot (Leiostomus xanthurus). These fish averaged about 3 or 4 to the pound.

South Carolina

SEED OYSTER EXPORT LAW PASSED: During March 1956 the South Carolina Legislature passed a law which makes it legal to cultivate seed oysters in South Carolina for export. The law, as set up, encourages the use of polluted grounds for seed purposes since the seed would be moved when very small. They would then have ample time to cleanse themselves before reaching marketable size. The new act specifies that oysters to be exported as seed may not be over $1\frac{1}{2}$ inches. The tax to ship seed oysters out of state has been established at 2 cents a bushel. There are several other provisions which will be of particular interest to possible seed growers in South Carolina. Commercial oystermen must continue to plan the same amount of cultch for market production as they have in the past. Only shells over and above that amount can be used for export.

The new law was to become effective upon the signature of the Governor of South Carolina. The Governor was expected to act on the legislation promptly. If so, it may be possible that some seed for export may be produced in the State during the summer season of 1956. Experimental shipments of seed oysters to various laboratories along the East Coast have already been made and the results of these plantings may determine if South Carolina seed will have a chance for growth and survival in out-of-state waters.

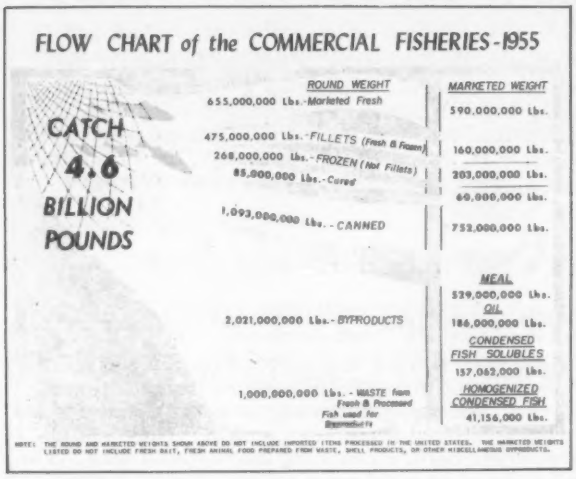
United States and Alaska

ECONOMIC DATA ON COMMERCIAL FISHERIES, 1955: It would take the income from a capital investment of $10.5 billion dollars at 4 percent annual interest to maintain earnings equivalent to those obtained in the United States and Alaska commercial fisheries during 1955. This information is one part of a preliminary analysis of the 1955 fisheries made by the U. S. Fish and Wildlife Service.

Earnings, which in this instance include profit on the investment and the wages or commissions paid those who handle the fish in the various States, are estimated statistically as follows: At the boat side, 75 percent of the value of the catch at that point; at the processor level, 10 percent of the value at that stage; wholesale, 5.5 percent; retail, 8 percent.

The catch for 1955 was 4.6 billion pounds and the ex-vessel value was $325,000,000. At the processor level the 1955 catch was worth $548,000,000; at the wholesale level, $775,000,000; and at the retail level, $1,010,000,000. In all instances these are slightly below 1954 when the ex-vessel value of the catch was $360,000,000.

There were 555,000 workers employed as the result of the activities of the fishing industry. Of these 153,000 were fishermen, 4,000 transporters, and 98,000 shore workers (which include those engaged in canning and other processing). There were 300,000 employed indirectly in such industries as gear manufacture, boat building, and manufacturing processing equipment. This is slightly less than the 568,394 employed in 1950 but considerably higher than the 428,965 in 1945.



American fishermen and businessmen had an investment with a replacement value of $958,000,000 in the commercial fish business in 1955. This figure is an estimated replacement value based upon 1955 data which shows that boats and gear in the commercial fisheries represented an original investment of $428,204,000; freezing and processing plants, $215,649,000; wholesale facilities, $193,475,000; and fish units in retail establishments, $92,257,000.

There were 87,000 craft of all types engaged in the year's fishing. These included 11,000 vessels of five tons net and over; 48,000 motorboats, and 26,000 other boats, all engaged in fishing. In addition there were 2,000 boats used for transportation of fish and shellfish between the fishing grounds and the docks.

The Pacific Coast States had the highest number of processing plants, 148. Of these Washington led with 76, California second with 52, and Oregon next with 20. The South Atlantic and Gulf States were next with 131 plants, Louisiana having 53 and Mississippi 23. The New England States had 84, of which 63 were in Maine; the Middle Atlantic States had 46 with 20 in New Jersey and 16 in New York. There were 20 processing plants in the Mississippi Valley and Great Lakes regions, of which 11 were in Iowa. Alaska was far in front among areas outside the continental United States with 109; Puerto Rico and American Samoa had one each; and Hawaii 2. There were 400 plants in which fish were canned and 227 in which byproducts were processed. The total number of plants, with duplications excluded, was 579.

The monthly catch in 1955 hit its peak in July when 887,800,000 pounds of fish were taken. The April catch was 170 million pounds, and the December catch 271,400,000 pounds.

In value at ex-vessel the shrimp industry was at the top, a posiiton it has held for several years. The 1955 value for shrimp was $70,000,000. Tuna and salmon follow in that order.

The 1955 supply of canned sardines was considerably below that of 1954. Heavy reductions in the supply of canned salmon and more moderate reductions in canned tuna stocks were noted. There was a decrease also in the supply of groundfish fillets (including ocean perch). Slight increases were noted in the supplies of shrimp, canned crab meat, and northern lobsters.

San Pedro, Calif., retained its leadership of individual ports in pounds of fish landed (365 million) followed by Reedville, Va., with 305 million; Lewes, Del., with 274 million; and Gloucester, Mass., with 265 million pounds.

The breakdown of manufactured products for 1955 was not available at the time of the analysis, but the 1953 figures show that the $585,995,000 value at the processor level was divided as follows: canned products, $306,874,000; packaged shellfish, $115,994,000; byproducts, $74,372,000; packaged fish, $52,163,000; cured fish, $36,592,000. Since the estimated value of the 1955 catch at the processor level is $548,000,000, the value of the various categories will probably be correspondingly less.

Fresh-water fishing in 1953 employed the most number of fisherman, 24,000; salmon was next with 21,000; then clamming with about 16,000; and shrimping fourth with 15,000. There were 14,000 engaged in taking oysters; other fisheries employed less than 9,000 each with the Maine herring fishery fifteenth on the list with only 1,050 workers.

Latest data on an area basis is for 1954 when the total American catch was 4,645,000,000 pounds, 45,000,000 pounds higher than the estimated catch for 1955. The data show the Atlantic and Gulf area most productive with 3,301,405,000 pounds, followed by the Pacific Coast States with 825,966,000, Alaska with 337,629,000 pounds, and the Great Lakes and Mississippi River fisheries with 180,000,000 pounds.

Imports of edible fishery products for 1954 totaled 803,369,000 pounds, compared with 725,195,000 in 1953 and 404,768,000 in 1945.

U. S. Canned Fish Production, 1955

California led the Nation in 1955 in the production of canned fish and in the manufacture of fishery byproducts, according to figures released April 5, 1956, by the U. S. Fish and Wildlife Service. The total value of these commodities was $147.4 million, nearly 40 percent of the national total of $386 million (value to the manufacturers).

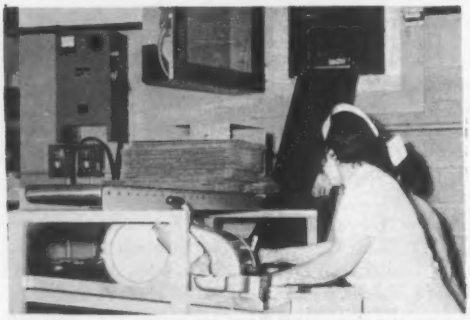
Alaska was second with canned fish and byproducts valued at $60 million. Washington was third with like commodities valued at $26.5 million, with Oregon, Maine, and Louisiana grouped with outputs approximating $21 million.

Nationwide there were 533 establishments engaged in canning fish and in the preparation of byproducts.

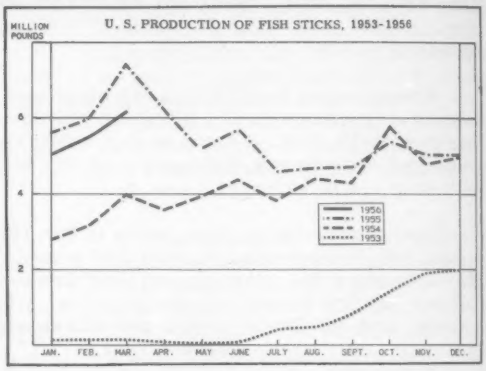
The value of the canned commodities was approximately $303.6 million and that of the byproducts about $82.5 million. The value of canned tuna and tunalike fish was $125 million; salmon $81 million; Pacific sardines $10 million; and Maine sardines $9 million. The value of canned shellfish was set at approximately $38.5 million.

U. S. Fish Stick Production

JANUARY-MARCH 1956 PRODUCTION BELOW LAST YEAR: The United States production of fish sticks during the first three months of 1956 amounted to 16.6 million pounds, according to Fish Stick Report, January-March 1956 (C. F. S. No. 1307) recently released by the U. S. Fish and Wildlife Service. This was 2.3 million pounds less than the quantity produced during the same period of 1955 but 1.2 million pounds more than the reported production for the last quarter of 1955.



Packing frozen packaged fish sticks into cartons as they come from the freezer on the conveyor system in a Boston plant.



A total of 5.0 million pounds of fish sticks was packed during January, 5.5 million pounds during February, and 6.1 million pounds during March. The largest quantity of fish sticks produced in a single month occurred during March 1955 when 7.4 million pounds were packed.

Table 1 - U. S. Production of Fish Sticks, January-March 1956

Month	Cooked	Uncooked	Total
	(Million Pounds)		
January	4.4	0.6	5.0
February	4.8	0.6	5.5
March	5.5	0.7	6.1
Total 1st. Quarter 1956	14.7	1.9	16.6
Total 1st. Quarter 1955	16.5	2.5	18.9

Table 2 - U. S. Fish Stick Production by Areas, Jan. - Mar. 1955-56

Area	January-March			
	1956		1955	
	Firms	Quantity	Firms	Quantity
	No.	1,000 lbs.	No.	1,000 lbs.
Atlantic Coast States	27	13,060	33	15,591
Interior and Gulf States	7	2,283	11	1,918
Pacific Coast States	10	1,259	15	1,440
Total	44	16,602	59	18,949

During the first quarter of 1956, 88 percent of the total production was precooked. Uncooked sticks accounted for the remaining 12 percent.

U. S. Foreign Trade

GROUNDFISH FILLET IMPORTS DROP 19 PERCENT IN MARCH 1956: United States imports of groundfish (including ocean perch) fillets during March 1956 totaled 11.7 million pounds, compared with 14.5 million pounds in March of last year. This was a decrease of 19 percent. The major cause for the decline was a 2.0-million-pound drop in imports of groundfish fillets from Canada. Smaller decreases were also noted for Iceland, Denmark, the United Kingdom, and Netherlands. Imports of groundfish fillets from Norway and West Germany were somewhat higher during March of this year than during the same month in 1955.

Canada again led all other countries exporting groundfish fillets to the United States with 6.4 million pounds in March 1956--54 percent of the total groundfish fillet imports during the month. Iceland was in second place with 4.3 million pounds.

Total groundfish fillet imports into the United States during the first quarter of 1956 amounted to 38.2 million pounds. This was 6 percent more than the quantity imported during the corresponding period of 1955. Canada, with 25.6 million pounds, led all other countries exporting fillets to this country during the above period, followed by Iceland (9.4 million pounds) and Norway (1.5 million pounds).

* * * * *

EDIBLE FISHERY PRODUCTS, JANUARY 1956: United States imports of edible fresh, frozen, and processed fish and shellfish for January increased about 28.9 percent in quantity as compared with December 1955, and were also 32.5 percent higher than the imports for January 1955. The value of the imported fishery products in January 1956 increased by 15.1 percent as compared with December 1955 and were higher by 39.4 percent than January 1955. The dollar value in January 1956 was close to 27.2 cents a pound, compared with 25.9 cents a pound in January 1955. Shrimp and fillet imports both increased in January 1956 when compared with January 1955.

United States Foreign Trade in Edible Fishery Products, January 1956 With Comparisons

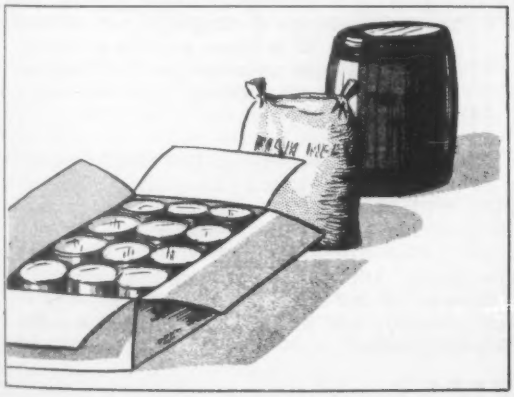
Item	Quantity			Value		
	Jan.		Year	Jan.		Year
	1956	1955	1955	1956	1955	1955
	(Millions of Lbs.)			(Millions of $)		
Imports:						
Fish & shellfish: fresh, frozen, & processed1/ . .	72.7	54.9	768.3	19.8	14.2	206.4
Exports:						
Fish & shellfish: processed1/ only (excluding fresh and frozen)	10.9	12.2	91.0	2.1	2.3	21.6

1/ Includes pastes, sauces, clam chowder and juice, and other specialties.

Exports of processed fish and shellfish for January 1956 decreased about 11 percent from the December 1955 total, and were 10 percent less than in January 1955. Stocks of exportable canned fishery products other than tunas were low in January 1956.

* * * * *

IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-FEBRUARY 1956: Notable among the trends shown in United States imports of fishery products during the first two months of 1956 were substantial increases in imports of groundfish fillets, frozen tuna, shrimp, canned salmon, fish meal, and fillets of flounder, wolffish, and fresh-water fish.



Compared to the first two months in 1955, imports for the first two months of this year of groundfish fillets and blocks increased 21 percent; blocks or slabs, however, were 26 percent less, while the plain fillets were 52 percent greater. Shrimp imports were 154 percent larger than those of the first two months of 1955. All frozen tuna imports increased 8 percent, but imports of albacore tuna were 28 percent less and other frozen tuna imports 55 percent greater than those of the same period a year ago. Imports of canned tuna this year were down 11 percent. Canned salmon imports in the first two months of 1956 were much greater than those of a year ago--5.3 million pounds, largely from Japan. Imports of fish meal were 16 percent larger than a year ago.

United States exports of canned sardines during the first two months of 1956 were 13 percent greater. Fish oil exports gained 13 percent.

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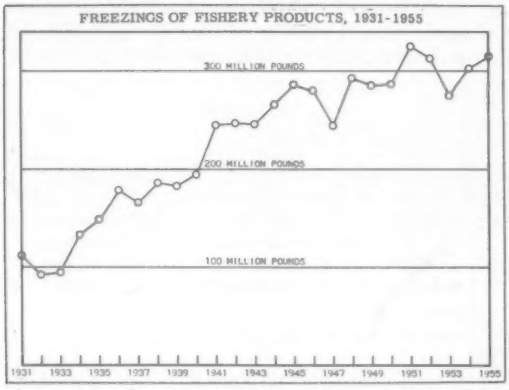
SHRIMP IMPORTS FROM MEXICO INTO ARIZONA-CALIFORNIA, 1955/56 SEASON THROUGH MARCH 17: The catch of shrimp in the Gulf of California appears to have set a record, according to the Service's Fishery Marketing Specialist at San Pedro, Calif. The imports of shrimp this season to March 17, 1956, from Mexico and entering the United States through Arizona and California totaled 28.6 million pounds as compared with 12.4 million pounds in the similar period of 1954/55. The 1955/56 Mexican west coast shrimp fishing season has been one of the most successful due to excellent production and a high price level because of poor catches in the Gulf of Mexico.

United States Freezings of Fish and Shellfish, 1955

Freezings of fish and shellfish in the United States and Alaska in 1955 amounted to 314.7 million pounds, according to Frozen Fish, 1955 (C.F.S. No. 1276) recently issued by the U. S. Fish and Wildlife Service. This was an increase of 12 million pounds, or 4 percent, over 1954 freezings. A catch of approximately 505 million pounds of fish and shellfish was required to produce the 314.7 million pounds of round, dressed, and drawn fish, fillets, steaks, and packaged shellfish frozen during 1955 by 287 firms throughout the United States and Alaska.



Of the year's total freezings, 69 percent were handled during the 6 months beginning with May and ending with October. Freezings during this period averaged nearly 36 million pounds a month, compared with an average of 16 million pounds a month during the other six months of the year.

Shrimp freezings (50 million pounds) led all others during the year, followed by ocean perch fillets (39 million pounds), whiting (36 million pounds), fish sticks (32 million pounds), and halibut (27 million pounds). These 5 items accounted for 58 percent of the total freezings.

Of the total 1955 freezings of fishery products, 169 million pounds (54 percent) was handled in the New England Area, followed by the South Central Area (46 million pounds), the Pacific Area (33 million pounds), and Alaska (32 million pounds). These four areas froze 89 percent of the yearly total.

Washington

BRINE SHRIMP USED TO FEED PINK SALMON FINGERLINGS: The Washington State Department of Fisheries is feeding Utah brine shrimp to pink salmon fry at its Hood Canal hatchery and the fish are thriving on them. The tiny salt-water shrimp are so tiny that it takes 26 million of them to fill a measuring cup.

Feeding the shrimp to the pink salmon fingerlings is part of an experiment which may ultimately aid in transplanting an even-year pink salmon run into Washington waters. (Pink salmon with a two-year life cycle normally run in Washington streams only on odd-numbered years.)

The salmon grow more uniformly with a brine shrimp diet than with the usual diet of fish viscera, and the shrimp diet virtually eliminates "pinheads" (fish that do not feed) and the subsequent mortalities from pinheads, report fisheries research workers.

Brine shrimp of the genus Artemia are a popular aquarium diet but have not been utilized previously in this state for the hatchery-produced salmon. The shrimp are commonly found in salty and alkaline lakes and artificial salt ponds throughout the world. The eggs are extremely hardy and will survive in a dried condition for years without harm to the germ cell. Upon introduction into water of proper salinity and temperature, they will hatch within about 48 hours and reach sexual maturity in about three weeks.

The dormant shrimp eggs are imported from Great Salt Lake, Utah, where they are harvested on the shore and dried. When placed in aerated jugs of heated sea water the tiny shrimp hatch out, increasing six times in volume and become live animacules that not only are relished by the pink salmon fry but are easier for the fish to eat. The shrimp go a long way as food, too; a quart of dry eggs will feed 500,000 pink salmon fry for a day.

The attempt by the Washington Fisheries Department to create an even-year run of pink salmon has met with varying results. A batch of 900,000 eggs from Alaska and Canada, hatched at the Samish hatchery in 1948 and transferred to the Deception Pass marine research station for salt-water rearing, brought gratifying results in 1950 when between 300 and 500 surviving adult pinks returned.

With these initially-encouraging results additional rearing of young pinks in salt water was undertaken, but new problems arose. The most spectacular was a heavy mortality due to pinheads. In effect, some of the fry eat well, while others eat little or not at all. Total mortality on regular hatchery diets in the past ranged from 40 to 60 percent, with a bulk of the mortalities caused by pinheads.

Rearing pink salmon to a size where they are competitive when they enter the open salt-water areas is a ticklish business and requires a closely supervised diet. The pinks feed primarily on plankton in the ocean.

Experiments in the feeding of brine shrimp will continue, but results so far add a happy note to the possibilities of creating a good, healthy liberation of reared even-year pink salmon in Washington waters.

* * * * *

EXPERIMENTS TO AID DOWNSTREAM SALMON MIGRATIONS AT MERWIN DAM: Juvenile salmon who landlock themselves behind power dams and never go to sea are as useless in maintaining their race as those who plunge to their death over spillways, according to a February 29 news release of the Washington State Department of Fisheries.

During the spring of 1956 the Washington Department of Fisheries, in cooperation with Pacific Power & Light Co., will attempt to solve the problems that make Merwin Dam on the Lewis River as much an obstacle to the downstream migrants on their way to sea as their parents found on their upstream spawning migration. Rehabilitation of several depleted salmon runs on major rivers is awaiting the outcome of this and associated studies.

The double barrier formed by Lake Merwin is typical at high dams which spill little or no incoming water during much of the spring and summer migration period. Silver salmon especially tend to landlock themselves on the Lewis River, and each spring yearlings by the tens of thousands never leave the upper watershed.

Experiments in 1952-55 at dams on the Elwha, Baker, and White rivers on Puget Sound proved that salmon were reluctant to use the turbine intake as an impoundment exit route if the latter were at substantial depths, particularly if surface water was being spilled. Moreover, even if the spillways and turbines were accessible, in most cases their mortality tolls made them equally undesirable.

The Merwin Dam tests will utilize a variety of flow volumes and intake depths over the next three months to find how much water it takes to attract impounded migrants into a collection system at the face of the dam, where they can be counted and led downstream. The different attraction depths will be tried because salmon have been found to disperse themselves over a wider vertical range behind a dam when it is not spilling water. When it is spilling, the young fish tend to move with the surface layer.

The end result, not only at Merwin Dam, but at others throughout the Pacific Northwest, should be a workable method of passing migrants around such structures with minimum mortalities and delay. Since conservation of power-producing water is important to the hydro-electric companies, another objective will be to determine the least flow that will do the job effectively.

Pacific Power & Light Co., which already contributes most of the operating funds for a salmon hatchery downstream from Merwin Dam and a smaller unit above its Yale Dam, will provide up to $24,000 for the project. This will be matched by the Department of Fisheries out of special funds provided by the 1955 Legislature for salmon rehabilitation research in the field of water storage and downstream migration problems.

* * * * *

EXPERIMENTS ON SALMON MORTALITIES AT McNARY DAM CONTINUED: A flotilla of 15 pontoon fishing platforms is being assembled by the Washington State Department of Fisheries on the Columbia River in a renewed phase of region-wide investigations into means of reducing salmon mortalities caused by power dams.

The pontoon nets will be dispersed over 35 miles of river below McNary Dam as part of a major fisheries research program being financed by the United States Army Corps of Engineers. Its principal objective will be to determine how the dam affects the survival of young salmon bound from the Snake and upper Columbia River watersheds for the ocean. From it, and associated studies assigned to other fishery agencies, are expected to come solutions for the critical problem of safeguarding the salmon runs of the Pacific Coast and Alaska in areas where hydro-electric power is dominant or proposed.

During the winter the pontoon fishing equipment has been under repair or construction at the Fisheries Department's Yakima shop. Beginning in March, crews of biologists and others will begin the task of releasing more than 700,000 marked chinook fingerlings at McNary Dam. Some will be liberated into the spillways, others in the turbine intake system, and some into the river immediately below the dam tailrace. The recovery nets will be spaced from a point downstream from the dam to Arlington, Ore.

An unusual phase of the study will be the use of tattooing machines to mark the young chinooks. The equipment, developed by Department researchers in 1953-54, injects various colored pigments under the skin as a substitute for the usual fin-clipped mark used to trace the migration of hatchery salmon.

* * * * *

IMPORTS OF SALMON REGULATED: In a notice to the fishing industry dated March 15, 1956, the Washington State Department of Fisheries issued the following regulation in regard to establishing certain procedures under which salmon imported from Alaska and Canada may lawfully proceed through the State of Washington in transit to out-of-state points during the closed season within the State.

"It shall be lawful for a common or contract carrier to transport, during seasons in which the taking, catching, or possession of chinook or silver salmon is unlawful in the State of Washington or in waters over which the State of Washington has jurisdiction, an original package or packages containing either silver or chinook salmon, which original package or packages both originate from and are destined for some other state, territory or foreign country provided, that for the purpose of this regulation, the term "original package" shall mean a package from which fish cannot be extracted without an opening or breaking thereof and which is accompanied by documentary proof that the original point of shipment and the point of destination is another state, territory or foreign country; provided further, that it shall be unlawful for any such carrier to open or break any such original package while the same is in his possession, except for the purpose of re-icing; provided further, that the waters of the Pacific Ocean shall not be considered a state, territory or foreign country."

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REBUILDING SALMON RUNS TO THE YAKIMA RIVER AND TRIBUTARIES PLANNED: The salmon population in the Yakima River and its tributaries may again approach those of the past if a comprehensive long-range rehabilitation plan prepared by the Washington State Department of Fisheries for the United States

Bureau of Reclamation is carried out. Completion of the plan would add nearly 2.5 million dollars a year to the value of the salmon take from the river, states a March 12 news release of the Washington State Department of Fisheries.

Three basic requirements are necessary for the over-all rehabilitation of the Yakima River system to aid in the development of its potential fish resource, ac-

cording to a comprehensive evaluation report prepared by the State Department of Fisheries in cooperation with the State Department of Game. They are:

1. Safe and efficient passage of adult fish upstream to their spawning grounds and of juveniles to the ocean. This will require both additional fishways and guaranteed minimum flows. The latter will depend largely on additional upriver storage.

2. Adequate conditions of water depth, velocity, and temperature, and maximum development of potential spawning areas.

3. Suitable rearing water for the young salmon until they are mature enough for departure to the ocean. A corollary is continued improvement and operation of the fish-screen system.

If these requirements are met, the report states, there is good chance to restore fish production to somewhere near its former level.

At present, annual production averages 860,000 pounds as compared to a catch (before 1900) of 7 million pounds. Potential production, assuming the introduction of sockeye salmon, which are not present at all now, is estimated at more than 4.5 million pounds. One of the steps toward realization of the program is the recently-completed vertical-baffle design fishway at the Prosser diversion dam on the Yakima. In the past, chinook salmon bound for spawning grounds in the upper Yakima and Naches rivers have had to use all of their famous endurance and "instinct" to ascend the Prosser Dam. Some years, when the water was low, the barrier was more of a delay than Bonneville Dam.

The new fishway, 150 feet long and 8 feet wide, is the first of its type on the Yakima. It is on the right bank of the river, adjacent to the intake foundation of an old power dam. Removal of the old pool-type fish ladder in the center of the dam also is scheduled, and a fishway similar to the one just completed will be installed about 150 feet from the left bank.

The new fishway has 14 automatically-regulated pools, each pool one foot higher than the preceding one, and is equipped with an auxiliary water supply system arranged to aid the rapid passage of fish upstream to spawn.

The increase in the capacity of Chandler canal, which made the new fishways even more necessary, also required the installation of two additional fish screen sections in the canal. The two new screens and eight formerly used have been converted to electrical drive, replacing the familiar paddle-wheel propulsion. The screens, each 10 feet wide and 11-12 feet in diameter, divert downstream migrants from the canal back to the river. The system is exceeded in size only by those at Sunnyside and Roza dams.

Total cost of the Prosser fish facilities to the Bureau of Reclamation will exceed $300,000. The Washington Department of Fisheries has contributed $15,000 to the construction cost and has shared the functional design work with the United States Fish and Wildlife Service.

Wholesale Prices, April 1956

In April 1956 the over-all wholesale index for all edible fish and shellfish (fresh, frozen, and canned) dropped 4 percent below that for March 1956 (108.6 percent as compared with 113.1 percent of the 1947-49 average), but climbed 10 percent above that for April 1955. Changes in the indexes for individual items were sharp, in some cases due to seasonal changes in supply and market conditions.

The index for the drawn, dressed, or whole finfish subgroup declined 12.3 percent from March to April 1956 because of lower prices for all items in this subgroup except frozen halibut (up 8.4 percent). During that period haddock prices at Boston dropped 36.2 percent and fresh yellow pike prices at New York City were down 60 percent. Changes downward are to be expected at this period of the year due to seasonally-better supplies of fresh haddock and fresh-water fish from the Great Lakes. Because halibut stocks are at a record low level and because the new fishing season in the North Pacific does not begin until mid-May, prices for this product went up. Compared with April 1955, this subgroup index in April 1956 was higher by 12.8 percent.

Boxing and icing fish for the wholesale market.

The fresh processed fish and shellfish subgroup index in April 1956 was about unchanged from March 1956, but was 16.9 percent higher than in the same month a year ago. Fresh haddock fillet prices at Boston declined 20 percent from March to April 1956, and were 7.3 percent lower than in April 1955. To offset this, fresh

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, April 1956 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1947-49=100)			
			Apr. 1956	Mar. 1956	Apr. 1956	Mar. 1956	Feb. 1956	Apr. 1955
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					108.6	113.1	113.7	98.7
Fresh & Frozen Fishery Products:					115.2	120.6	121.7	98.1
Drawn, Dressed, or Whole Finfish:					100.5	114.6	114.1	89.1
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.05	.08	50.1	78.5	86.9	64.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.34	.32	106.2	98.0	97.5	68.1
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.61	.61	137.1	137.6	134.3	112.4
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.69	.82	171.0	204.5	181.0	179.7
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.60	.80	121.3	161.8	131.4	151.6
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.54	.82	110.6	168.0	150.6	141.4
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.21	.52	49.3	123.1	129.0	64.5
Processed, Fresh (Fish & Shellfish):					126.6	126.5	127.6	105.2
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.24	.30	81.7	102.1	110.6	88.5
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.79	.77	124.8	120.9	121.7	101.1
Oysters, shucked, standards	Norfolk	gal.	5.62	5.62	139.2	139.2	139.2	114.4
Processed, Frozen (Fish & Shellfish):					114.3	112.3	116.5	95.3
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.40	.39	103.4	102.1	102.1	110.0
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.29	.29	91.0	91.0	92.6	86.3
Ocean perch, skins on, 1-lb. pkg.	Gloucester	lb.	.29	.29	114.8	114.8	114.8	111.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.76	.73	116.5	113.0	119.6	84.1
Canned Fishery Products:					99.2	102.4	102.4	99.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	case	21.27	21.27	120.0	120.0	120.0	109.6
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	case	10.70	11.80	77.1	85.1	85.1	91.6
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	case	7.38	7.12	86.1	83.2	83.2	85.2
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	New York	case	8.45	8.45	89.9	89.9	89.9	76.6

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

shrimp prices increased about 3.2 percent between March and April 1956 and were 24 percent higher than in April 1955.

The April 1956 index for the frozen processed fish and shellfish subgroup was up slightly (1.8 percent) when compared with the previous month and also higher by 20 percent compared with April 1955. The rise between March and April 1956 and from April 1955 was due mainly to higher frozen shrimp prices. Frozen shrimp prices in April 1956 at Chicago were 38.5 percent higher than in April 1955.

The canned fishery products subgroup index in April 1956 experienced its first decline in several months almost entirely due to a drastic cut in canned tuna prices because of liberal stocks of the light-meat grade. The index for this subgroup from April 1955 to April 1956 was about unchanged. However, April 1956 prices for canned pink salmon and Maine sardines, because of a very light supply, were substantially higher than in April 1955. On the other hand, April 1956 prices for canned tuna were significantly lower than in the same month a year ago.

CORRECTION: In the April 1956 issue of Commercial Fisheries Review, page 27, in "Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, February 1956 with Comparisons," the second column under the heading "Avg. Prices" should have been headed "Jan. 1956" and the second column under the heading "Indexes (1947-49-100)" should have been headed "Jan. 1956."

The same table in the May 1956 issue also had the same type of error--the second column under the heading "Avg. Prices" should have been headed "Feb. 1956" and the second and third columns under the heading "Indexes (1947-49-100)" should have been headed "Feb. 1956" and "Jan. 1956," respectively.

DANISH EXPERIMENTS ON ELECTROLYTIC TIN-PLATE CANS

Experiments carried out at the Danish Ministry of Fisheries Research Laboratory, Copenhagen, Denmark, on electrolytic tin plate cans have shown that none of the Danish fish packed in the unlacquered cans had good keeping quality. The tin plate tested contained 0.25, 0.50, and 0.75 pound of tin per base box (5.6, 8.4, and 16.8 gm. of tin per m^2 of the surface). Sardine and mackerel in oil can be packed in lacquered cans, but fish in tomato sauce and other corrosive products cannot be packed in cans lacquered with lacquers available in Denmark.

--Konserves, Nov. 1953.

International

INTER-AMERICAN SPECIALIZED CONFERENCE ON CONSERVATION OF NATURAL RESOURCES

RESULTS OF MEETING ON CONTINENTAL SHELF AND MARINE WATERS: The Inter-American Specialized Conference on "Conservation of Natural Resources: The Continental Shelf and Marine Waters" was adjourned March 28 after it had approved a resolution. The Conference opened in Ciudad Trujillo, Dominican Republic, on March 15.

"I - The Inter-American Specialized Conference on Conservation of Natural Resources: Continental Shelf and Marine Waters considering: That the council of the organization of American States in fulfillment of resolution LXXXIV of the Tenth Inter-American Conference held in Caracas in March 1954, convoked this Inter-American specialized conference 'for the purpose of studying as a whole the different aspects of the juridical and economic system governing the submarine shelf, oceanic waters, and their natural resources in the light of present-day scientific knowledge;' and that the conference has carried out the comprehensive study that was assigned to it; resolves: To submit to the consideration of the American states the following conclusions:

"1. The seabed and subsoil of the continental shelf, continental and insular terrace or other submarine areas adjacent to the coastal state outside the area of the territorial sea and to a depth of 200 meters, or beyond that limit to where the depth of the superjacent waters admits of the exploitation of the natural resources of the seabed and subsoil, appertain exclusively to that state and are subject to its jurisdiction and control.

"2. Agreement does not exist among the states here represented with respect to the juridical regime of the waters which cover said submarine areas nor with respect to the problem of whether certain living resources belong to the seabed or to the superjacent waters.

"3. Cooperation among states is of the utmost desirability to achieve the maximum sustainable yield of the living resources of the high seas bearing in mind the continued productivity of all species.

"4. Cooperation in the conservation of the living resources of the high seas may be achieved most effectively through agreements among the states directly interested in such resources.

"5. In any event, the coastal state has a special interest in the continued productivity of the living resources of the high seas adjacent to its territorial sea.

"6. Agreement does not exist among the states represented at this Conference either with respect to the nature and scope of the special interest of the coastal state or as to how the economic and social factors which such state or other interested states may invoke should be taken into account in evaluating the purposes of conservation programs.

"7. There exists a diversity of positions among the states represented at this conference with respect to the breadth of the territorial sea.

"II - Therefore, this conference does not express an opinion concerning the positions of the various participating states on the matters on which agreement has not been reached and: Recommends: That the American States continue diligently with the consideration of the matters referred to in paragraphs 2, 6, and 7 of this Resolution with a few to reaching adequate solutions."

At the conclusion of the Conference and in view of certain statements made by the delegations of other countries at the final plenary session on March 27, the United States delegation issued the following statement:

"(A) The government of the United States does not recognize a right on the part of a coastal state as claimed by certain delegations to exclusive

control over the resources of the high seas. The United States maintains that in accordance with international law fishery regulations adopted by one state cannot be imposed on nationals of other states on the high seas except by agreement of the governments concerned. Moreover, the United States delegation also wishes to record the fact that it made a specific proposal for the conference which would, if adopted, effectively meet the conservation problem that would be posed in the event of failure of the interested states including the coastal state to reach agreement on the need for and application of conservation measures.

"(B) The government of the United States does not recognize that a state has competence to determine the breadth of its territorial sea apart from international law.

"(C) The delegation of the United States also wishes to call attention to the fact that broader consideration having been given at this conference than at any previous Inter-American meeting to the various aspects of the subject on its agenda, the present resolution of Ciudad Trujillo constitutes the latest and most authoritative expression of the Organization of American States on the subjects discussed therein.

Note: Also see Commercial Fisheries Review, May 1956, p. 37.

INTERNATIONAL LAW COMMISSION

CONVENES AT GENEVA FOR EIGHTH SESSION: The grouping together systematically in a single report of all the rules adopted by it in respect of the high seas, the territorial sea, the continental shelf, contiguous zones, fisheries, and the protection of the living resources of the sea, will be among the tasks before the United Nations International Law Commission (ILC) at its eighth session starting April 23 and ending about June 29 in Geneva.

The Commission, whose 15 members are recognized international law experts elected by the General Assembly, has as its objective the promotion of the progressive development of international law and its codification.

Questions pertaining to the "regime of the high seas" and the territorial sea--forming the first two items of an 11-point provisional agenda--have been before the Commission for several years and have been the subject of a number of reports prepared by J.P.A. Francois of the Netherlands, a member of the Commission and special rapporteur on this subject.

The Commission prepared, at its seventh session, a set of provisional articles concerning the regime of the high seas and a number of draft articles on the regime of the territorial sea which were subsequently circulated to governments for comment. The observations of the 18 governments which have so far replied and a further report by Professor Francois will form the basis for discussion by the Commission in the light of which a final report on the law of the sea is expected to be drawn up for submission to the eleventh session of the General Assembly.

There are a number of other items on the provisional agenda of the Commission not related to the subjects indicated above.

The members of the Commission are: Gilberto Amado (Brazil), Douglas L. Edmonds (United States), Sir Gerald Fitzmaurice (United Kingdom), J.P.A. Francois (Netherlands), F. V. Garcia-Amador (Cuba), Shuhsi Hsu (China), Faris Bey el-Kouri (Syria), S. B. Krylov (U.S.S.R.), L. Padilla Nervo (Mexico), Radhabinod Pal (India), Carlos Salamanca (Bolivia), A.E.F. Sandstrom (Sweden), Georges Scelle (France), Jean Spiropoulos (Greece), Jaroslav Zourek (Czechoslovakia).

GENERAL AGREEMENT ON TARIFFS AND TRADE

AUSTRIAN CANNED FISH IMPORT DUTIES RENEGOTIATED: Changes in Austrian import duties on canned salmon, pilchards, and tuna in brine will result from the negotiations under Article XXVIII of the General Agreement on Tariffs and Trade. Duties on canned tuna in oil will be bound at the old rate. These negotiations were based on the draft of a new Austrian tariff which utilizes the standardized Brussels nomenclature and ad valorem rates on most tariff items. The new tariff is expected to be put into effect upon approval of the Austrian Parliament early in 1956.

The new and old tariff rates are as follows:

Old Tariff No.	New Tariff Item	
	16.04 B.	Other prepared on preserved fish;
	1.	In airtight containers:
ex 107	ex a	Tuna-fish, salmon and pilchards, solely in oil; 15 percent ad valorem (old rate 15 percent); Non-GATT rate, 15 percent.
ex 107	ex b	Tuna-fish, salmon and pilchards, cooked or smoked in own juice; 180 schillings per 100 kilograms--equivalent to US$3.15 per 100 pounds (old rate 15 percent); Non-GATT rate 595 schillings per 100 kilograms--equivalent to US$10.40 per 100 pounds.

Imports from the United States under the latter item in 1954 were valued about US$1,000. These items were freed from quantitative restrictions on dollar imports as of July 15, 1955.

In the negotiations, the United States agreed to a modification of tariff concessions previously granted by Austria. Austria was permitted to alter 13 concessions directly granted to the United States in prior negotiations. Three of these were withdrawn and 10 were raised and then bound at the higher level. To compensate for these withdrawals and modifications, Austria reduced rates on 8 items below the levels at which they were previously bound and granted new concessions on 23 items. Sixteen items on which Austria agreed to grant compensatory concessions were freed from quantitative restrictions on dollar imports.

Negotiations to this end followed decisions by Austria to invoke Article XXVIII of the General Agreement on Tariffs and Trade which permits GATT countries, at specified but infrequent periods, to withdraw or modify concessions previously granted. No changes in United States duties were involved in this renegotiation.
Note: Also see Commercial Fisheries Review, May 1956, p. 37

FOOD AND AGRICULTURE ORGANIZATION

MEDITERRANEAN FISHERIES COUNCIL TO MEET IN TURKEY: The General Fisheries Council for the Mediterranean Sea will hold its fourth meeting in Istanbul from September 17 to 22, 1956. Invitations have been sent to 14 countries and six international organizations to send representatives.

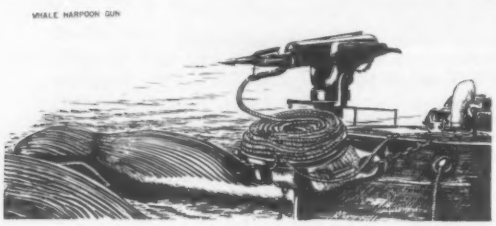
Eleven member countries on the Council--Egypt, France, Greece, Israel, Italy, Monaco, Spain, Tunisia, Turkey, United Kingdom, and Yugoslavia--are expected to send delegates. Some other non-member countries interested in the Mediterranean fisheries have been invited to send observers, reports the March 9 issue of The Fishing News.

The meeting is expected to lead to more effective cooperation in matters concerning the Mediterranean fisheries, chief aim of the Council.

At the third meeting experts submitted 54 papers, a valuable contribution to the study of Mediterranean fishery problems, and the Council has issued an invitation to send special papers to the Istanbul meeting.

WHALING

1956 ANTARCTIC PELAGIC WHALING RESULTS BELOW 1955 SEASON: Sharp competition between a larger number of expeditions for a smaller quota of whales (15,000 blue-whale units this season as against 15,500 in 1955) made this year's season 15 days shorter than the previous season. This season's Antarctic pelagic (open sea) baleen whaling season, which ended March 5, resulted in a provisional catch of 14,860 blue-whale units, or somewhat less than the 15,300 blue-whale units in 1955. Seven countries participated in this season's pelagic whaling, which opened on January 7, 1956.



Norway: In spite of the increased efficiency of Norwegian catchers, only 2 of the 9 Norwegian Antarctic expeditions exceeded last year's baleen whaling catch.

Total Norwegian production of 783,568 barrels (133,200 metric tons) of whale and sperm oil for this season was slightly lower than the 1955 production of 806,244 barrels (137,060 tons), states a March dispatch from the United States Embassy in Oslo.

The Norwegian Thorshammer made out better than any of the other Norwegian floating factories, despite the fact that it is one of the oldest and that its boiling plant is relatively inefficient. On top of that, it operated with only 8 catching vessels, while some of the more modern ones had up to 16. According to several old-timers, this proves that Antarctic whaling nowadays is a sheer gamble, and something should be done about it.

For the Norwegian expeditions as a whole, the 1956 Antarctic whaling season marked a new low, yielding only Kr. 137 million (US$19.2 million) worth of whale oil, as against Kr. 186 million (US$26.1 million) in 1955 and Kr. 227 million (US$31.8 million) in 1954. The whale oil production in three seasons was, respectively, 654,848 barrels (111,311 metric tons), 668,352 barrels (113,620 metric tons), and 929,077 barrels (157,943 metric tons). The average for each Norwegian catcher vessel was only 5,953 barrels, as compared with 9,540 barrels for each of the Japanese catcher vessels. Soviet and British catcher vessels were also ahead. To most of the Norwegian whaling specialists, the trend is disturbing, whatever the cause. Altogether about 7,000 Norwegians earn their living as whalers. Of these, some 5,000 are engaged by Norwegian expeditions, and 2,000 work for British companies. In addition, whale and sperm oil provide the raw materials for a growing processing industry, which employs quite a few workers. Above all, whaling is an important source of foreign exchange.

The Norwegian Whaling Association marketing pool states that all of Norway's 1956 season whale and sperm oil has been sold for about 230 million kroner (US$32.2 million), compared with the value of 212 million kroner (US$29.7 million) for the 1955 production. Early in the season 19,000 long tons of whale oil were sold for about US$245 a long ton, and the remainder of the catch was sold for about US$238 a ton. The average price for the 21,000 tons of this season's sperm oil was between US$189 and US$196.

A statement published in the Sandefjords Blad and reproduced in the March 29, 1956, News of Norway, describes the 1956 season as disappointing. "The widely varying results achieved by the individual expedition," the newspaper writes, "clearly indicates that the whale stock is declining." The Sandefjord Blad also states that leaders of the Norwegian whaling industry are hoping for an international agreement to limit the number of catcher vessels employed by the expeditions. This, many believe, would cut costs without reducing the whale catch.

There is general agreement in Norwegian whaling circles that the total quota for the 1957 Antarctic season should be reduced from 15,000 to 14,500 blue-whale units, as a means of preserving the whale stock. At last year's International Whaling Convention, held in Moscow, the Norwegian delegates raised the question of placing neutral observers aboard all factory vessels.

In a recent move, the Norwegian Whaling Association has made strong efforts to restore the international agreement on voluntary limitation of the number of catcher vessels that may be used by each expedition, which was in effect during the 1953/54 and the 1954/55 whaling seasons. Norwegian whaling operators are of the opinion that too many catcher vessels are attached to each expedition, particularly in view of the relatively short season, which this year lasted only 58 days. Sending more catcher vessels than strictly necessary is a losing proposition, they feel.

Whaling requires heavy investments and the cost of operation runs high. Construction of a modern factory vessel costs well over Kr. 40 million (US$5.6 million), and annual operating expenditures average Kr. 20-25 million (US$2.8-3.5 million). A new catcher vessel comes to Kr. 6-7 million (US$840,000), and at least Kr. 1 million (US$140,000) is needed to pay for each year's operations. It costs an average of Kr. 400,000 (US$56,000) per day to keep an expedition on the Antarctic hunting grounds.

Union of South Africa: The South African whaling expedition this season produced 13,431 short tons of whale oil, 4,776 tons of sperm oil, 3,253 tons of whale-meat meal, and 29 tons of whale livers, according to press reports received by the United States Foreign Agricultural Attache at Pretoria (March 14). The total value of these whale products is estimated at US$4.8 million dollars at the primary level.

The total production of oil was 110,000 barrels for the 1956 season, as compared with 99,000 barrels in 1955, and 147,000 barrels for 1954.

Japan: The catch of the three Japanese Antarctic expeditions which participated in the 1956 season was 5,154 baleen whales, or 2,742 blue-whale units, as compared with 4,989 whales, or 2,772 units, in 1955. The 1956 Japanese baleen catch yielded 102,141 metric tons of whale products as compared with 93,126 tons the previous season.

The total catch for the season, including sperm whales, which began at the end of 1955 on an unlimited basis, amounted to 6,462 whales, which yielded 115,321

Table 1 - Japanese Antarctic Whale Catch, 1954/55 and 1955/56 Seasons

Season	Baleen						Sperm	Grand Total	No. of Mother-ships	No. of Catcher Boats
	Blue	Fin	Hump-back	Sei	Total	Total Blue-Whale Units				
	(Number)									
1955/56	383	4,524	240	7	5,154	2,742	1,308	6,462	1/ 3	40
1954/55	590	4,220	179	-	4,989	2,772	967	5,956	3	36

1/ In the 1955/56 season, one of the fleets operated from 11/24/55 to 3/5/56; one from 11/22/55 to 3/5/56; and one from 12/3/55 to 3/4/56.

metric tons of whale products. The previous season's catch amounted to 5,956 whales and a yield of 102,873 tons. Thus there was an increase of 10.8 percent in the baleen and sperm catch and 11.2 percent in yield as compared to the previous season's totals.

Japan produced 57,611 metric tons of baleen oil from this season's catch, of which 51,500 tons, according to present plans, will be exported. So far 35,500 tons have been sold to West Germany at a reported price of £86 per metric ton, compared to a price of £74 for the previous season's production. It is also reported by a reliable source that 3,600 tons of sperm oil have been sold to the United States at a price equivalent to £71 per ton. Japanese exports of fish oils, including whale oil, are expected to reach a high level during the coming year owing not only to larger production of whale oil, but also heavy production of herring oil coupled with a favorable price trend in the European market.

Table 2 - Japanese Production of Whale Products from Antarctic Catch, 1954/55-1955/56 Seasons

Product	1955/56 Season			1954/55 Season		
	Baleen	Sperm	Total	Baleen	Sperm	Total
	(Metric Tons)					
Oil	57,611	11,894	69,505	53,555	8,822	62,377
Frozen meat	35,564	180	35,744	29,489	5	29,494
Salted meat	8,895	1,073	9,968	9,952	791	10,743
Liver oil	71	24	95	53	17	70
Others	-	9	9	77	112	189
Total	102,141	13,180	115,321	93,126	9,747	102,873

Note: 1 blue-whale unit equals 1 blue whale, or 2 fin whales, or 2.5 humpback whales, or 6 sei whales. Thus, the actual number of whales taken during the season is far greater than the indicated number of units.

Also see Commercial Fisheries Review, March 1956, p. 28.

POLISH AND SOVIET FLEETS FISH IN NORTH ATLANTIC

The Soviet Union and Poland are conducting extensive fishing operations in the North Atlantic Ocean and the North Sea, according to an interview published in Extrabladet, a Copenhagen newspaper, and reproduced in the February 8 Fiskaren, a Norwegian fishery trade periodical.

The Soviet Union has a fleet of 350 craft (mostly from Murmansk) with four large motherships. According to the Danish citizen interviewed (who was a Soviet herring inspector in the Faroe Islands in 1953), the fleet in 1953 carried 5,000 crewmen and fished practically the whole year by following the migrating shoals of herring. The Soviet herring catch has been large and is estimated to be close to 1.5 million barrels (200 pounds a barrel), valued at about US$21.72 a barrel ex-vessel.

During the summer months the herring fleet fished off Jan Mayan, an island between Norway and Greenland; later in the season it moved to the east coast of Iceland; a few months later it was off the Faroe and Shetland Islands; and it operated off the Coast of Norway near Aalesund for the winter herring fishery.

The report states that the fishermen appear to be very competent and satisfied with their work. The crews on the mothership include women as cleaners and packers of the herring. Most of the vessels are new vessels built in Danish shipyards.

Poland was reported to have 525 vessels and a mothership of 800 tons in the fishing areas of the Atlantic Ocean and the North Sea. The Polish fleet has set a goal of 1,286,000 barrels in 1956.

ICELAND EXHIBITS AT INTERNATIONAL FISHERY TRADE FAIR

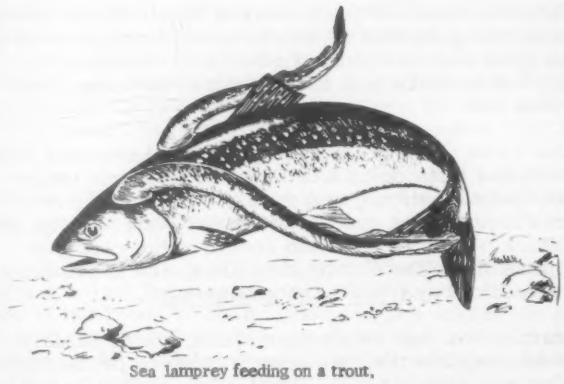
For the first time Iceland will exhibit its fishery products at the International Fishery Trade Fair, Copenhagen, Denmark, May 18-27. A special Fair Committee was formed by the Icelandic Government to organize prospective exhibitors at the Fair. Products exhibited consisted of cured and frozen fish, fish meal, cod-liver oil, shrimp, caviar, and canned fishery products, according to the Press Service of the International Fishery Trade Fair in Copenhagen.

Part of the exhibit was an information booth which provided the numerous visitors with details about the Icelandic fishery products available for export.

GREAT LAKES FISHERIES COMMISSION

FIRST MEETING: The first meeting of the six-member International Great Lakes Fishery Commission, created by Canada and the United States to coordinate efforts to protect the Great Lakes fisheries, opened in Ottawa on April 23, 1956. Canadian Fisheries Minister James Sinclair welcomed the Commissioners of the two countries at the opening session of the three-day meetings.

A nonregulatory body, the Commission was provided for in the Convention on Great Lakes Fisheries which was brought into force last October in Ottawa when an exchange of instruments of ratification took place between Canada and the United States. The Commission may make recommendations, based on research findings, to make possible the maximum sustained productivity of the Great Lakes fishery.



Sea lamprey feeding on a trout.

One of the most important jobs facing the Commission is the coordination of the scientific research of various agencies engaged in the study of the Great Lakes fisheries, especially that dealing with the control of the parasitic sea lamprey which has caused serious damage to some of the fisheries and which is a continuing threat to others.

Members of the Great Lakes Fisheries Commission for Canada are Dr. A. L. Pritchard, Director, Conservation and Development Service, Department of Fisheries, Ottawa; Dr. W. J. K. Harkness, Chief, Division of Fish and Wildlife, Ontario Department of Lands and Forests, Toronto; and Dr. A. O. Blackhurst, Manager, Ontario Council of Commercial Fisheries, Port Dover, Ont.

United States Commissioners are Claude Ver Duin, Mayor of Grand Haven, Mich., Lester P. Voigt, Wisconsin State Conservation Director, Madison, Wis., and John L. Farley, Director, Fish and Wildlife Service, U. S. Department of the Interior.

Mr. Farley was elected Chairman of the Commission for a two-year term, and Dr. Pritchard Vice-Chairman.

The Commission will establish headquarters in either Ann Arbor, Mich.; or Toronto, Ont. The decision on the site will be made after quarters in both cities

have been investigated by a committee made up of Claude Ver Duin, Chairman of the United States section of the Commission, and Dr. A. L. Pritchard, Vice-Chairman of the Commission and chairman of the Canadian section. Pritchard and Ver Duin will report at the next meeting of the Commission, which will take place in Sault Ste. Marie, Ont., on July 30.

An executive secretary will be employed to supervise the work of the Commission. The post of executive secretary is open to residents of Canada and the United States, and will call for scientific and administrative qualifications of a high order. Until a permanent appointment is made, the work of the Commission will be directed by Dr. James Moffatt, Chief, Great Lakes Fishery Investigations, U. S. Fish and Wildlife Service, who will act in a temporary capacity.

The Great Lakes Fisheries Convention, ratified by Canada and the United States, is the fourth treaty in which both countries have come to bilateral agreement on fisheries conservation matters. The other conventions deal with salmon, halibut, and Pribilof seals.

This Convention provides for joint action in Great Lakes fishery research as well as in a program for the elimination of the predator sea lamprey in these waters. The Convention, which will have an initial duration of 10 years, provides for the establishment of a Great Lakes Fishery Commission made up of three appointees from each country.

Deep concern by both countries over the decline of some of the fisheries of the Great Lakes, and the serious damage being caused by the lamprey, brought about the recognition of the necessity for joint and coordinated efforts to determine the needs for the type of measures which may make possible the maximum sustained productivity of the Great Lakes fisheries.

This Convention area embraces Lake Ontario (including the St. Lawrence River from Lake Ontario to the 45th parallel of latitude), Lake Erie, Lake Huron (including Lake St. Clair), Lake Michigan, Lake Superior, and their connecting waters. The Convention also applies to the tributaries of each of the above waters to the extent necessary to investigate any stock of fish of common concern, the taking or habitat of which is confined predominantly to the Convention Area, and to eradicate or minimize the population of the sea lamprey (Petromyzon marinus).

A nonregulatory body, the Commission may only recommend, on the basis of research findings, measures to make possible the maximum sustained productivity in the Great Lakes fisheries.

The Commission has the following duties: (a) to formulate a research program or programs designed to determine the need for measures to make possible the maximum sustained productivity of any stock of fish in the Convention Area which, in the opinion of the Commission, is of common concern to the fisheries of Canada and the United States of America and to determine what measures are best adapted for such purpose; (b) to coordinate research made pursuant to such programs and, if necessary, to undertake such research itself; (c) to recommend appropriate measures to the Contracting Parties on the basis of the findings of such research programs; (d) to formulate and implement a comprehensive program for the purpose of eradicating or minimizing the sea lamprey populations in the Convention Area; and (e) to publish or authorize the publication of scientific and other information obtained by the Commission in the performance of its duties.

In order to carry out these duties, the Commission may: (a) conduct investigations; (b) take measures and install devices in the Convention Area and the tributaries thereof for lamprey control; and (c) hold public hearings in Canada and the United States of America.

Electricity, poisonous chemicals, and ultrasonics are all being tested by Canadian and United States scientists as weapons in their war on the predatory sea lamprey, which is playing havoc with the stocks of lake trout and whitefish in the Great Lakes.

A temporary scientific committee appointed by the international Great Lakes Fishery Commission reported at the meeting that the most effective device developed for controlling the sea lamprey is an electrical barrier, placed across streams tributary to the Great Lakes, up which the lampreys go to spawn.

On the Canadian side 29 such barriers are in operation on Lake Superior and on Lake Huron. On the United States side there are 48 barriers on Lake Superior, 19 on Lake Michigan, and 1 on Lake Huron.

The committee reported that the lamprey-control network should be completed on Lake Superior this year. This would call for an additional 10 to 20 barriers on the Canadian side and 6 on the United States side. In addition, the Commission will this year build 55 barriers on Lake Michigan, and similar installations will be completed on Lakes Michigan and Huron in the following two years.

It is estimated that construction of electrical barriers on all lamprey-spawning streams flowing into all the Great Lakes should be completed by the end of 1960.

The first work is being done on Lake Superior because there are still sizable stocks of lake trout surviving there. In Lake Michigan the lake trout populations are virtually extinct while in Lake Huron all that are left are small numbers in Georgian Bay. The lake trout have also been greatly reduced in numbers in Lake Ontario. Catches of whitefish in all five of the Great Lakes are low, but it is not known exactly how much of the blame for this can be placed on the lamprey, as whitefish are particularly subject to random fluctuations.

The electrical device kills only mature lampreys as they ascend the stream to spawn. The scientists are now working on methods which it is hoped will destroy the younger generations which are not affected by the barriers.

In order to avoid duplication of effort, fishery biologists of both countries have been meeting frequently since 1946 to coordinate research and control measures. Out of hundreds of chemicals possibly useful for poisoning the young lampreys, the United States scientists have narrowed the field to the eight most probable poisons which could kill lampreys but which would not be toxic to other forms of wildlife or to human beings. In Canada, experiments are being made with ultrasonic devices, as well as the improvement of present control by means of the electrical barrier.

At the meeting the Commission appointed a permanent scientific committee, made up of biologists from both countries, to continue joint efforts to control the lamprey and also to develop and recommend a research program as the basis for management of all fisheries in the Great Lakes.

Canada

ATLANTIC SALMON REGULATIONS FOR 1956: No major changes in regulations or program for the coming year were proposed at the annual meeting of the Federal-Provincial Coordinating Committee on Atlantic Salmon held in Ottawa on February 17. However, the meeting was in favor of the formation of an advisory committee to be made up of representatives of the commercial salmon fisheries and angling organizations in the Atlantic provinces. Letters are to be sent to those

provinces suggesting that the commercial and angling groups in Quebec, Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland each appoint one member, making ten members in all. This advisory committee would meet with the coordinating Committee at the time of its annual meeting.

At the meeting the scientific subcommittee reported on the research carried out in 1955 and on the work done on the salmon streams. The subcommittee was instructed to continue its present program. The largest single project for the coming year is the construction of a fishway at a falls on the LaHave River in Nova Scotia, which is expected to double the productive area of the LaHave basin, adding about 280 square miles to the spawning area.

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COMPLIANCE WITH CANNED FISH AND SHELLFISH IMPORT REGULATIONS REQUIRED: At a recent meeting of the Inspection Officers of the Canadian Department of Fisheries, it was brought out that a great number of exporters in shipping canned fish and shellfish to Canada are not complying with subsection 3 of section 28 of the Meat and Canned Foods Act--Canned Fish and Shellfish and Cannery Inspection Regulations. The Canadian Consular General in a personal communication points out that the section in question reads:

"(3) No person shall import or attempt to import any canned fish or shellfish unless all marks on the cans which identify the canner, the date of packing, and the coding of the lot, are clearly stamped or stenciled on both ends of the cases or containers in which such cases are shipped; such marks shall also be listed on the affidavid prescribed by subsection (1)."

The Canadian authorities point out that if exporters continue to disregard this regulation, the Canadian Department of Fisheries has no other recourse than to refuse entry to shipments until they are properly marked.

* * * * *

LABELING REGULATIONS FOR FRESH, FROZEN, OR PROCESSED FISH AMENDED: The Fish Inspection Regulations (Section 59) of Canada have been amended, according to the Fisheries Council of Canada. The amended regulations are as follows:

59. (1) All containers in which fresh or frozen or processed fish is packed shall be correctly and legibly marked or labeled to indicate

(a) the vernacular name of the fish,
(b) the net weight of the contents, and
(c) the name and address of the person, firm or corporation by whom or for whom they are produced and packed or by whom they are distributed;

(2) All wrappers for fresh or frozen or processed fish shall be correctly and legibly marked or labeled to indicate

(a) the vernacular name of the fish,
(b) the net weight of the contents unless such contents are to be weighed at time of retail sale,
(c) the name and address of the person, firm or corporation by whom or for whom they are produced and packed or by whom they are distributed, and,
(d) the words "Product of Canada."

(3) Marking or labeling prescribed by subsection 1(a), 1(b), 2(a), and 2(b) shall, in respect of other than wooden containers, be not less than three-sixteenths of an inch in height and shall appear on the main body or face of the container or wrapper.

(4) Marking or labeling prescribed by subsection (1) shall appear on one end of a wooden container.

(5) No person shall mark, label or package any fresh, frozen or processed fish in a manner that is false, misleading or deceptive.

(6) Except as herein otherwise provided, containers and wrappers in which fresh or frozen or processed fish is packed for sale in markets outside of Canada may be exempted from any or all of the provisions of this section at the discretion of the Minister.

It is believed that "fish" in the Canadian regulations refers to both fish and shellfish.

* * * * *

MESH REGULATIONS FOR NORTHWEST ATLANTIC TRAWLERS: Regulations governing mesh sizes in nets used by Canadian fishing trawlers and draggers in certain areas of the Northwest Atlantic will go into effect on January 1, 1957. The new mesh sizes are designed to conserve stocks of cod and haddock, reports the February 1956 Trade News, a Canadian Department of Fisheries publication.

Canada's Department of Fisheries has announced that the new regulations, recommended by the International Commission for the Northwest Atlantic Fisheries, will be similar to those in effect since June 1953 for the Georges Bank area off the New England coast, known as Subarea 5. The subareas to be affected next year are number 3 (Newfoundland fishing banks and waters adjacent to that province) and number 4 (Nova Scotia waters, the Gulf of St. Lawrence and the Bay of Fundy).

Because scientific investigation has shown that the stocks of fish in each of the subareas are distinct and separate, and that there is a slower growth rate in Subarea 3, different minimum mesh sizes are specified for Subareas 3 and 4. The mesh size in Subarea 4 is to be a minimum of $4\frac{1}{2}$ inches, similar to that already in effect in Subarea 5, but in Subarea 3 a 4-inch mesh size will be permitted. The nets affected are those used by all types and sizes of trawlers and draggers fishing for cod and haddock. The mesh sizes are based on the use of 102 millimeter manila twine, measured wet after use. Tables of equivalent mesh sizes when measured dry for other types of net material have been compiled and will be available from the Biological Station of the Fisheries Research Board of Canada at St. Andrews, N. B., or from the federal Department of Fisheries.

To prevent the impairment of fishery operations conducted primarily for species other than cod and haddock, the new regulations will permit the use of smaller mesh nets by vessels fishing for these other species. However, such vessels may have in possession on board only specified amounts of cod and haddock caught incidentally in the smaller-meshed nets.

Experiments in some years have demonstrated that the larger mesh sizes release as much as half the haddock now wasted at sea, with negligible loss of fish of marketable size. Wastage of small cod at sea is less serious than that of haddock, but as much as 25 percent by number have been discarded in some years in the Gulf of St. Lawrence area.

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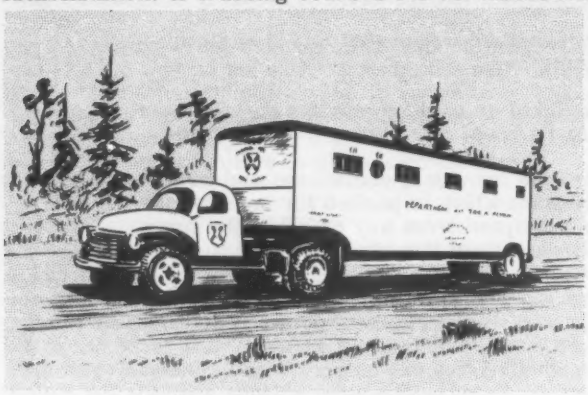
MOBILE SCHOOLS SUCCESSFUL IN TRAINING NOVA SCOTIA FISHERMEN: During and after the last war modernization of the Nova Scotia fishing fleet was rapid and the new equipment in the form of boats, nets, and engines required the establishment of training courses for the fishermen. The Nova Scotia fishermen have always been competent, but new inventions and techniques which have come with mechanization--coupled with a modern economic system--demanded that these changes be mastered by any man who would earn his living by fishing. Following a survey of the needs of the fishermen, the Nova Scotia Department of Trade and Industry in 1946 in conjunction with the Department of Labor established a fisheries training program.



Canadian traveling marine engine school.

At first the program (opened to all bona fide fishermen) embraced navigation and engine maintainance, and became an immediate success. Later courses in the repair, design, and dimensions of nets were added. Then fishermen were encouraged to switch to vessels especially built to serve their needs. For this purpose the Nova Scotia Fishermen's Loan Board was set up to help finance the new operations. Inspectors made sure that vessels so bought were constructed on sound lines.

For the fisherman himself the larger unfamiliar vessels posed more new problems. Longer fishing range made necessary a greater knowledge of navigation. Strange nets and good gear require adaptation to new fishing techniques. Engine performance became of great importance. The courses were tuned to the stepped-up demand for knowledge.

Graduates of the net and gear course prepare to test their skills.

Recently in Halifax the new Bluenose Princess--a 40-foot-long shopmobile trailer, big enough to accommodate 12 men for gasoline-engine instruction or eight men for Diesel-engine instruction--was added to the training program. It was the second such shopmobile equipped to offer 4-week courses to the fishermen of Nova Scotia.

Since 1946, training in engine repair and maintenance and in navigation has been given to more than 1,200 fishermen in 30 fishing areas of the province. The success of the program may be measured also by the demand for these courses, which made it necessary to add the second shopmobile.

The use of a large trailer equipped for engine instruction is said to be unique on the North American continent. Many inquiries have come to provincial authorities for more information about it. Certainly it has proved of great service to the fishing industry in Nova Scotia. Often the fishermen bring their own motors to the school, where they overhaul them while learning how to take down the engines and make minor repairs. When they encounter major problems they are encouraged to send the parts to plants properly equipped for the type of repair needed.

The two shopmobiles now in operation are well-fitted for their work. In addition to the Diesel and gasoline engines which the instructors use for demonstration, they are actually fully-equipped machine shops. Both shopmobiles also contain living quarters for the instructor-drivers. They are heated by propane gas and can be set up at any place where electrical power is readily available.

The mobile navigation schools also operate four-week courses. Schools are limited to 15-18 trainees at a time. Instruction is given in the fundamentals of navigation, rules of the road, compasses, chart work, lights, and foghorns. The trainees also learn about aids to navigation such as loran, direction finders, echo-sounders and radiotelephones, tide tables, radio beacons, signaling, and magnetism.

Like the navigation schools, the net and gear schools are at present held in convenient halls or classrooms. But already plans are afoot to provide a trailer classroom for the navigation courses, and provincial fisheries officials are planning also for future expansion in the nets and gear school.

In this school the fishermen learn to design nets, to alter designs and dimensions to suit the towing power and speeds of their boats, and how otter doors and warps and nets themselves are likely to act in a given set of circumstances. Even the basic rules for splicing rope and wire are taught. When he is finished, he knows the proper designs of otter trawls and the adaptation of any design to the methods and techniques of particular kinds of fishing.

Most classes are fitted into the off-season for fishing in the various districts. While they are attending the classes, the fishermen are given a subsistence allowance ranging from $1.50 a day for single trainees living at home to $3.75 a day for married men away from home. The only requirement in addition to being bona fide fishermen and residents of Nova Scotia is that they attend classes regularly and work seriously.

It all adds up to the fact that Nova Scotia's fishing industry is advancing with mighty strides. By 1954 the landed value of Nova Scotia fish was more than four times the prewar figure. The quantity has increased by close to 40 percent. Forty-three modern long-liners and 30 draggers have been added to the fleet. Several new fish-processing plants have been put into operation and millions of dollars have been spent, modernizing and expanding existing plants.

Note: Abstracted from article by A. C. Rhydwen in March 1956 Trade News, a publication of the Canadian Department of Fisheries.

Chile

NEW WHALE PROCESSING PLANT: A Santiago newspaper (March 26, 1956) reports that a new whale processing plant will soon be completed at Iquique in the northern part of Chile by one of the country's most important whaling companies. The new plant is expected to double the company's processing operations by the latter part of 1956. (Foreign Trade, April 28, 1956, a publication of Canada's Department of Trade and Commerce.)

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REGULATIONS FOR EXPLOITATION OF SOUTH PACIFIC WATERS APPROVED: The Chilean Diario Oficial of April 7, 1956, published Decree No. 102 of March 9, 1956, approving the Regulations for Permits for Exploitation of the Riches of the Southern Pacific as drawn up at the tripartite conference held in Quito in December 1955 between Chile, Peru, and Ecuador, the United States Embassy at Santiago reports (dispatch dated April 11).

Note: See Commercial Fisheries Review, January 1956, p. 42.

Ecuador

FIRST NATIONAL FISHERY CONGRESS HELD FEBRUARY 22-24: Ecuador's First National Fishery Congress, organized by private fishing interests, was convened in Quito February 22-24. The congress met with considerable support from the Government and passed a number of resolutions designed to stimulate Ecuador's fishing industry. A number of the resolutions adopted by the congress would have the effect, if enacted into law by the Ecuadoran Government, of further restricting foreign fishing operations in the territorial waters claimed by Ecuador, according to reports.

German Federal Republic

NEW FISHERIES SERVICE VESSELS: The Fish Section of the West German Federal Food Ministry has placed an order with a shipyard in Cuxhaven for a new

The Meerkatze, a West Germany fisheries service vessel.

fisheries service vessel. The hull of the new ship will resemble that of the fisheries research vessel Anton Dohrn, placed in service about a year ago. Superstructure will be similar to that of the Meerkatze, another fisheries service vessel operated by the government. The new ship will be about 186 feet over-all, with a 30-foot beam. The new ship will have a 1,000 hp. oil-burning steam engine, and a crew of 26. The ship's keel was to be laid in May 1956; the new vessel should be in service by mid-1957. The total cost of the vessel is expected to be about US$712,000, states a March 12 dispatch from the United States Consul at Bremen.

The Food Ministry is reported to have recently purchased a Hamburg fishing trawler of 330 gross tons to be converted into another fisheries service vessel.

This vessel will replace the obsolete service ship Frithjof (242 gross tons) which was built in 1916. The converted vessel will be put into service in July 1956.

The two fisheries service vessels (Meerkatze and Frithjof) fill a number of needs for German fishing vessels and their crews on the high seas are frequently giving help to fishing boats of other nations. The service vessels carry small hospitals staffed with qualified personnel to provide medical aid to fishermen on the high seas. The vessels are also equipped to give technical assistance to trawlers. The service ships carry meteorological observation stations and laboratories to conduct experiments and research in the field of marine biology and oceanography. During the six-year period from 1948 until 1954, the two ships made 121 trips, spent 2,595 days on the high seas, and medical aid was given in 7,183 cases.

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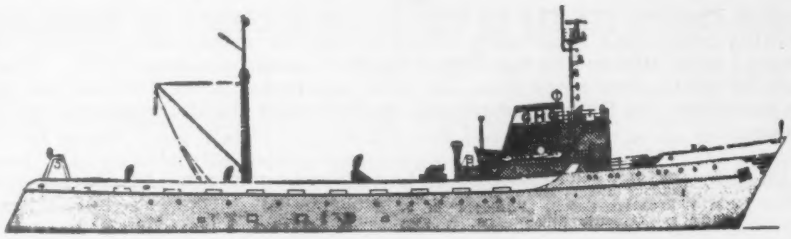
NEW TYPE FACTORYSHIP TRAWLERS TO BE BUILT: Following some successful trials of factory-type fishing trawlers by the British and also the recent delivery of the 12th factoryship trawler by a shipyard in Kiel to the Soviets, the West German deep-sea fishing industries have apparently decided to fall in step with the trend towards this system of fishing. Three trawler companies in Bremerhaven have placed orders with a local shipyard to build a new type of fishing trawler which has been described as an interesting compromise between the traditional type of trawler and the latest version of a factory fishing vessel.



New type of "semifactory trawler" being built in West Germany.

One compelling reason for this development is the length of the fishing trips made by German trawlers. The long trip makes it extremely difficult to land fish in a fresh condition and to meet the public's ever-growing demand for better-quality seafood. German trawlers travel for about one week to reach their fishing grounds for demersal fish (ocean perch, cod, haddock, etc.) off the Icelandic and Greenland coasts. One week of fishing is followed by a one-week return trip. The fish caught during the first days at the fishing grounds are about two weeks old before they arrive in port, and often a substantial percentage of the early catch has to be sold to the fish meal factories, a March 15 dispatch from United States Consul General in Bremen states.

Several factors have delayed an earlier switch to factoryships in West Germany. Apart from the hotly-disputed question of the economy of such ships, the cost of the vessels, which is estimated to amount to more than US$710,000 has been one of the major obstacles. The German Federal Government is subsidizing interest rates for loans to build factoryships and this fact has gone a long way to facilitate the necessary investments by the trawler companies.

The length of the new type of "semifactory trawler" between perpendiculars is about 200 feet, width about 30 feet, height up to the top deck about 22 feet, draft about 15 feet. The ships will be powered by two Diesel motors each of 650 hp. One ship will be equipped with two horizontal Voith-Schneider propellers making the

installation of a rudder superfluous. The other two ships will be built with the conventional-type propeller and rudder. The ships will have two decks. The top deck will carry the usual type of catching gear. The lower deck will carry the fish-processing machines, including a 15-ton fish meal plant, fish-oil extractors, filleting machines, and sharp-freezers. Only the fish caught during the first few days will be processed. The rest will be transported to the home ports fresh, in fish holds capable of carrying 600,000-700,000 pounds of fish. The fish meal and oil plants will permit the vessels to utilize the waste from the filleting and cleaning operations.

The outstanding feature of the new vessels will be the stern trawl now in use on British and Soviet factoryships. Instead of fishing across the broad side of the ship, the trawl net will be towed over the stern. A slanting slide facilitates the bringing in of the net. Through two chutes the catch is dumped on the lower deck for dressing and processing. The total crew of this type of ship, including fish processors, will number about 33.

Japan

SALMON FISHING FLEETS TO FISH IN NORTH PACIFIC AS SCHEDULED: Japanese fishing companies reportedly intend to fish for salmon as originally scheduled in the general area affected by the Soviet Union's recent announcement. They plan to dispatch 19 fleets, five more than last year, operating some 500 catcher boats. Normally these salmon fleets leave Japan for northern Pacific waters in the first week of May.

The Dai Nippon Fishery Association has already presented the Japanese Government with a petition protesting the action of the Soviet Union and, because of the vagueness of the Soviet pronouncement with respect to the area affected and specific measures to be taken, is apparently willing to risk fishing in the area, in support of its contention that the unilateral action on the part of the Soviet Union is a violation of international law.

The Association also stated that the companies are taking the risk on their own and are not "troubling" the Japanese Government. The Association is hopeful that a settlement of this question may be reached before the fleets are dispatched.

The Japanese Government has presented a strong protest to the Soviet Union and has publicly announced its willingness to discuss fishing matters with the Soviets without regard to the other unsettled issues pending between the two countries.

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SALMON LONG LINERS ASK POSTPONEMENT OF LICENSING: The chairman and 16 representatives of the Committee for promoting salmon long-lining in the North Pacific visited the Japanese Fisheries Agency and members of the Diet from Miyagi Prefecture in March to request that the application of a licensing system for salmon long-lining south of 48 degrees north latitude, which was scheduled to begin in April, be postponed for one year. (Nippon Suisan Shimbun, March 8.)

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TUNA GROUNDS IN ARABIAN SEA SURVEYED BY TRAINING SHIP: The Japanese training ship Shunkotsu Maru (577 tons) of the Ministry of Agriculture and Forestry's College of Fisheries at Shimonoseki returned on March 2 from a training cruise to the Arabian Sea. The ship sailed about November 15 with 47 students

aboard and made a survey of the tuna long-lining grounds in the Arabian Sea at the western extreme of the Indian Ocean. Stops were made at Singapore, Colombo, Bombay, and Keelung en route, according to the March 8 Nippon Suisan Shimbun, a Japanese newspaper.

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SWORDFISH EXPORTS TO BE HANDLED BY ASSOCIATION: All exports of frozen swordfish from Japan will be handled by the Japan Frozen Food Exporters Association, beginning April 1, 1956. Individual Japanese exporters may designate their United States importer, but if no designation is made the Association will make the selection. The plan is not designed to eliminate United States importers, but only to control export volume and prices. Japanese exporters are no longer permitted to deal directly with United States importers, according to a March 23 dispatch from the United States Embassy in Tokyo.

For the Japanese fiscal year 1956, 8 million pounds will be exported at prices varying from 18 cents a pound for 30-pound slabs or fillets to 28 cents a pound for slabs of 100 pounds or more.

Mexico

FOREIGN SHRIMP BOATS OUTSIDE JURISDICTIONAL WATERS: During a press conference, held March 14, the Senator from the Campeche province of Mexico stated, that most of the fishing by foreign boats off Campeche takes place outside the Mexican 9-mile jurisdictional limit. The Mexican Coast Guard has been instructed to maintain the 9-mile limit.

Foreign ships fishing inside the 9-mile limit will be apprehended and made subject to Mexican law. International practice permits foreign boats to seek haven in Mexican ports without violating the law in case of storms or distress, a March 15 dispatch from the United States Embassy in Mexico City states.

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SHRIMP SEASON ON PACIFIC COAST NORTH OF MAZATLAN ENDED: The west coast of Mexico north of Mazatlan was closed to shrimp fishing on March 15, 1956. This area includes the most productive area on Mexico's west coast. The southern Pacific coast area of Salina-Cruz will remain open and some production can be expected from this area until June, at which time fishing usually ends due to poor catches.

The area from Mazatlan north will close for 30 days and the closed period may be extended 30 additional days which will carry over into the non-productive season.

Norway

AUREOMYCIN USED TO PRESERVE FRESH FISH: Experiments conducted by the biological-chemical division of the Norwegian Fisheries Directorate on preserving fresh fish with aureomycin have proved successful. Newly-caught fish have been kept fresh for 19 days by use of ice which contains small quantities of crude

aureomycin. With ordinary ice the fish can be kept only up to 12 days, states a United States Embassy dispatch (April 13) from Oslo. Because the aureomycin is destroyed in cooking, consumption of the treated fish will not build up resistance to the drug.

If the method is practical, it will be a significant advantage to Norwegian fresh fish exports, especially for shipping fresh cod from North Norway to the large British market.

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FISH EXPORT TRADE PROSPECTS GOOD: Prospects are good for Norwegian exporters of fishery products, according to a March 16 dispatch from the United States Embassy in Oslo. During 1955 the value of fishery products exports reached a record total of about US$132.7 million (947.5 million kroner).

Exports of frozen fillets have improved because of a pick up in sales during February 1956. Large stocks had been accumulated at the beginning of 1956, due to the relatively high price asked for Norwegian frozen fillets. It was expected that all stocks would be sold by the end of April 1956.

The export price for dried fish was reduced by US$1.60 a 100 pounds (25 kroner a 100 kilos), bringing the price down to about US$26 a 100 pounds (409 kroner a 100 kilos) f.o.b. Bergen. This price reduction was necessary in order to enable Norwegian exporters to compete with Icelandic dried fish. Tariff reductions by one of Norway's chief customers (Nigeria) will permit the price reduction with very little loss to the exporters. It was believed that the 16,000 metric tons of dried fish on hand as of January 1 will be sold without difficulty.

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HIGH RAW FISH PRICES CAUSE FROZEN FISH PRODUCTION CUTBACKS: The high price of raw fish has caused most of North Norway's freezing plants to cutback production, according to director of Norsk Frossenfisk A/S. For direct delivery to the plant, the freezing plants pay higher prices to the fishermen for raw fish than the minimum of 70 øre per kilogram (4 U.S. cents a pound) fixed by the Government. The freezing plants are compensated by refunds from the Price Regulation Fund for Fish up to a fixed quota for each plant. If the plant uses more fish than its quota allows, it receives no refund, an April 13 United States Embassy dispatch from Oslo points out. The large catches of cod this year have made more fish available to the plants than provided for in the quotas, hence the plants are cutting production back to the quota level in order to avoid losing the benefit of the refund.

The high price of Norwegian frozen fish fillets has not hurt sales on most foreign markets, but reports indicate that it is impossible to compete profitably on the United States market. On the other hand, the Ministry of Fisheries is more inclined to blame the sales decline in the United States on current low market prices rather than on high raw fish costs in Norway.

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SALTED HERRING PRODUCTION FOR 1956 SEASON: The Norwegian Winter Herring Salters Association announced early in April that 600,000 barrels of salt herring would be packed for export from the 1956 season's catch, compared with 613,000 barrels from the 1955 season. Shipments of about 450,000 barrels (50,000 metric tons) to the Soviet Union should be completed by the end of May. Most of the rest of the herring has already been sold to several other smaller markets.

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SHRIMP INDUSTRY: Shrimp fishing in Norway is based on the deep-water shrimp, Pandalus borealis. It is usually found in deep fjords and in submerged channels of the coast on soft clay bottoms. The commercial fishery for shrimp is conducted in depths of about 50-220 fathoms, states an April 19 report from the United States Embassy in Oslo.

Table 1 - Norwegian Shrimp Catch, 1953-1955

Year	Quantity	Ex-vessel Value
	Metric Tons	US$1,000
1955	5,533	2,240
1954	4,961	1,890
1953	3,763	1,428

The shrimp grounds extend the length of the Norwegian coast from the Skagerak in the south to Varangerfjord in the north. There are no seasonal limitations and fishing goes on throughout the year. The boats used in shrimp fishing are from 20-50 feet long, the smaller boats operating in the more protected fjords while the larger boats are used on the open sea. Shrimp trawl nets of 13 to 16 fathoms in length are used.

There are many small receiving sheds and freezing plants along the coast where shrimp are fished most extensively. There are also a number of small canneries located near these installations whose chief activity is canning shellfish and small herring, brisling, etc. Most of the shrimp is either consumed in Norway or exported fresh, only a small percentage of the catch is canned (see tables).

Table 2 - Norwegian Fresh and Frozen Shrimp Exports, 1953-1955

Year	Quantity	Value
	Metric Tons	US$1,000
1955	1,795	1,876
1954	1,585	1,568
1953	1,512	1,204
1946-50 Avg.	1,184	672

Table 3 - Norwegian Exports of Canned Shellfish, 1953-1955

Year	Quantity	Value
	Metric Tons	US$1,000
1955	1,891	2,338
1954	1,713	1,988
1953	1,432	1,694
1946-50 Avg.	1,468	1,344

In the last few years there has been a considerable increase in the catches of shrimp, particularly in North Norway, although several productive grounds have been opened up on the southern coast. The commercial size of Norwegian shrimp varies from 9 to 12 centimeters (3.5-4.5 inches) total length, with 90-160 heads-on shrimp a pound. The smaller shrimp are ordinarily used for canning. The number per pound varies somewhat with the seasonal variations in the size of shrimp caught.

Most of the Norwegian shrimp is exported iced or frozen in the shell, although in the last few years there has been a growing market for frozen peeled shrimp in cartons or plastic containers. The United Kingdom and Sweden are the chief markets, accounting for 96 percent of Norwegian iced or frozen shrimp.

Statistics on exports of canned shrimp are not available. Shrimp is included with crab meat, lobster, and crayfish in the category of canned shellfish (table 3). The United Kingdom and Sweden buy about 80 percent of Norwegian canned shellfish exports.

Shrimp fishing in Norway is usually carried out from small boats manned by one or two fishermen. There are no government supports, loans, guarantees, or special concessions for shrimp fishing other than those for Norwegian fishing in general. The shrimp industry has, however, received some assistance from government research organizations in locating and mapping new shrimp grounds.

There are no foreign vessels or foreign capital engaged or invested in the shrimp fishery of Norway.

The potentialities for expansion of shrimp fishing in Norway are good, particularly in North Norway where operations up to now have been confined to the coast and a few fjords near freezing plants. There are also good possibilities for more extensive operation farther out to sea, for example near Spitzbergen and Bear Island where there has been no shrimp fishing previously. The extent of commercially-profitable shrimp fishing grounds in the Norwegian Sea have not been accurately determined, but cursory investigations by research and private vessels indicate that there are considerable areas where fishing could be expanded.

Market conditions for shrimp are favorable both in Norway and abroad. Exports will probably continue to rise at about the same rate as production. As new packing and freezing methods are adopted by the small plants along the coast, a larger proportion of the catch, both fresh and canned, will be exported.

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REVIEW OF THE FISHERIES, 1954-55: The total catch of all fishery products by Norwegian fishermen in 1955 was 1,635,233 metric tons (about 2.3 billion pounds). This was 269,648 tons less than the record catch of 1954. The catch for 1955 was the fourth highest on record, but the value of the 1955 catch (about US$84 million) was the highest ever recorded, according to the January 1956 Norwegian Fishing News.

Table 1 - Norwegian Fishery Products Landings and Ex-Vessel Values, 1951-55

Year	Quantity	Value
	1,000 Metric Tons	US$1,000
1955	1,635	84,012
1954	1,905	79,490
1953	1,398	68,025
1952	1,670	73,093
1951	1,669	68,949

During 1955 the catch of herring and sprats decreased 332,222 tons or 23 percent under the 1954 total. The winter herring fishery produced 965,413 tons (valued ex-vessel at US$27.3 million)--126,317 tons and US$0.9 million less than the record production of 1954. The fat and small herring fisheries were considered a failure in 1955. The climatic conditions were not favorable to these fisheries. The fat-herring fishery yielded 35,312 tons, or a fourth of the 1954 catch; and the small-herring fishery, 100,994 tons--half of the 1954 catch. The 1955 catch of sprats was 5,904 tons, compared with a catch of 8,861 tons in 1954 and 13,297 tons in 1953. The sprat catch was light, and failed especially during the summer of 1955 in the main brisling-sardine packing season.

Table 2 - Norwegian Fishery Products Landings by Fish Groups

Type of Catch	1955		1954	
	Landings	Ex-vessel Value	Landings	Ex-vessel Value
	1,000 Metric Tons	US$ 1,000	1,000 Metric Tons	US$ 1,000
Herrings & sprats	1,138	34,481	1,470	38,765
Cod & cod by-products	249	25,773	204	19,572
Other kinds 1/	248	23,758	231	21,154

1/ Chiefly haddock, pollock, hake, ocean perch, and halibut.

The total catch of Icelandic herring, mostly cured, in 1955 was 24,200 tons, an increase of 4,151 tons over the 1954 catch. The 1955 trawl-herring fishing (on the Fladenground) yielded 5,077 tons, or 1,839 tons more than in 1954.

Due to price increases, the ex-vessel value of the herring and sprat catch was at a high level. The average winter herring price was about US$1.30 per 100 pounds, compared with US$1.12 per 100 pounds in 1954.

The catch of cod and cod byproducts ranked second to the herring group in 1955 and exceeded the 1954 catch by 44,867 tons.

Note: Values converted to US$ equivalents on the basis of 7.143 kroner equal US$1.

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SOVIET DELEGATION TO STUDY FISHERIES: A Russian fisheries delegation of 12 men, headed by the Minister of Fisheries, arrived in Oslo on March 11 by air on a study visit at the invitation of the Norwegian Government.

The visit, originally due to start on February 3, was postponed by the Russians after 16 Russian herring boats had been arrested on charges of fishing in Norwegian waters.

The program also was changed. Instead of studying the Norwegian herring fisheries, which were at their peak in February, the delegation was scheduled to study North Norway's cod fishing (The Fishing News, March 16.)

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WINTER HERRING CATCH SETS RECORD: The Norwegian winter herring fishery ended about April 1 with an all-time record catch of 1,144,000 metric tons (about 2.5 billion pounds). This record catch compares with 950,267 tons in 1955 and 1,088,000 tons in 1954. The value of the 1956 winter herring catch was close to US$35 million as compared with US$28.1 million in the previous record year of 1954, states an April 6 dispatch from the United States Embassy in Oslo.

On February 14 the Norwegian winter herring fishery turned from the sloe herring to the spring herring. At the beginning of the winter herring fishery this year, the hydrographical conditions were unlike those prevailing during the previous seasons. After the first reports from the Norwegian research vessel G. O. Sars of herring shoals approaching coastal waters, 16 days elapsed before the fishing made actual progress. The weather conditions were not favorable, but the principal reason for the poor catches were extraordinary hydrographical conditions. The sloe herring shoals, however, appeared from January 24 until February 14 at the usual fishing places and weather conditions were good. The winter herring fisheries extend generally from January to April.

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TRAINING SCHOOLS FOR FISHERMEN: Five Norwegian State-operated vocational training schools for fishermen, claimed to be the most up-to-date in the world, have begun a new year with full enrollment. They provide intensive courses lasting from five to ten months.

A total of 120 of the 240 students in the five schools take the head-fisherman course, 60 the motor-tender course, and 60 the cooking course. Other subjects are marine plant life, fish biology, migrations, and fluctuations in supply.

A new project is a program for advanced education of university graduates who have to deal with fisheries questions, launched by the Society for the Promotion of Norwegian Fisheries, which also sponsors a broader fisheries educational program for the public. This includes the Bergen Museum of Fisheries and a fisheries section in the Trondheim Science Museum.

A professor of marine biology at Oslo University says the fisherman's training provided in Norway is on a higher level than in any other country. "The industry is in process of rapid development. By continually relaying the latest research results to the working fishermen, the vocational schools and other educational schemes will be able to stimulate further growth of the industry. That Norway has pioneered in this field is due to the close and varied cooperation among fisheries trade organizations, government agencies, and private institutions." (The British periodical, The Fishing News of March 9.)

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WINTER COD CATCH GOOD: The 1956 Lofoten winter cod fishery ended about April 20 with a total catch of 63,500 metric tons. The catch was valued at US$7.7 million (55 million kroner). The total catch for 1956 winter season at Lofoten exceeds the 1955 and 1954 catches by close to 20,000 tons, but is lower than the average catch since the end of World War II.

The cod catch at Lofoten plus the catch from south of this area amounts to 113,700 tons as compared with a total catch of 83,100 tons in 1955. Of this year's cod catch, 40,100 tons have been sold for drying, 56,300 tons for curing, and 17,300 tons for the fresh and frozen trade. The cod roe was disposed of as follows: 3,214 tons for salting; 1,345 tons for canning and the fresh trade. The cod-liver oil production amounted to 5,300 tons. (Fiskets Gang, April 26, 1956.)

Panama

PINK SHRIMP RETURN TO THE GULF OF PANAMA: The "pink" shrimp, which were in the Gulf of Panama for several days early in March, returned later in the month. The catches were heavy and if the strong northeast winds continued another ten days as expected, Panama's catch of "pink" shrimp was expected to reach 1 million pounds, according to information received by the United States Embassy in Panama (March 22) from the Panamanian Government Fisheries Research Laboratory. Catches in previous years have not exceeded 300,000 pounds.

Because the Panamanian fishing industry was better prepared this year to handle the shrimp, the boats have been able to bring in catches of 5,000 to 7,000 pounds each. As much as 80,000 pounds of shrimp have been packed in one day as compared to the previous record of 30,000 pounds. Approximately 300,000 pounds of "pink" shrimp were caught up to the date of dispatch.

Peru

EXPORTS TUNA TO WEST GERMANY: The part of the Peruvian fishing industry engaged in the freezing of tuna for export was encouraged by a recent purchase of frozen tuna for export to West Germany. The possible expansion of the market for both frozen and canned tuna in Europe would help to offset the weaker market for these products in the United States, according to reports, states a February 24 dispatch from the United States Embassy at Lima.

Portugal

FISHERIES TRENDS, NOVEMBER 1955: Sardine Fishing: The catch of the Portuguese sardine fleet declined seasonally in November 1955 to 7,426 metric tons, or about 31 percent less than the October 1955 catch. The November 1955 sardine catch was valued at about US$1.2 million ex-vessel as compared with US$1.4 million in October 1955.

The sardine canning industry absorbed 63 percent (4,651 tons) with most of the balance consumed fresh. The port of Matosinhos lead all others with a catch of 4,816 tons of sardines and contributed 4,062 tons (ex-vessel value US$704,600) to the canning trade.

Other Fishing: The landings of fish other than sardines totaled 956 tons, valued at US$73,412 ex-vessel. The catch of fish other than sardines was 97 percent chinchards (924 tons), followed by bonito (21 tons), and 11 tons of mixed mackerel, anchovies, and tuna, the February 1956 Conservas de Peixe reports.

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CANNED FISH EXPORTS, JANUARY-NOVEMBER 1955: Portuguese canned fish exports totaled 6,522 metric tons (343,200 cases), valued at US$3.4 million, during November 1955; and 57,223 tons, valued at US$29.0 million, during January-November 1955.

Portugal's exports of canned fish in November 1955 declined about 18 percent when compared with the previous month. During January-November 1955 Germany continued as the leading receiver with US$5.5 million of canned fish (about all sardines in oil), followed by Italy with US$4.4 million (principally sardines and tuna), Great Britain with US$4.2 million, and the United States with US$3.6 million (principally 3,015 tons of sardines in oil or sauce, 39 tons of tuna and tunalike fish in oil, and 1,765 tons of anchovies). Exports of canned fish to these 4 countries (during the Jan.-Nov. period) amounted to 58.8 percent of the total exports.

Portuguese Canned Fish Exports, November 1955 and Comparisons

Species	Nov. 1955		Jan.-Nov. 1955	
	Metric Tons	1,000 US$	Metric Tons	1,000 US$
Sardines in olive oil	5,489	2,704	46,233	22,528
Sardinelike fish in olive oil	470	404	4,394	3,113
Sardines & sardinelike fish in brine	90	16	1,822	343
Tuna & tunalike in olive oil	192	151	2,081	1,538
Tuna & tunalike in brine	137	67	713	360
Mackerel in olive oil	128	73	1,430	860
Other fish	16	11	550	297
Total	6,522	3,426	57,223	29,039

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CANNED FISH PACK, JANUARY-SEPTEMBER 1955: The pack of canned sardines in oil or sauce for January-September 1955 amounted to 18,214 metric tons

Portuguese Canned Fish Pack, Jan.-Sept. 1955

Product	Net Weight	Canner's Value	Product	Net Weight	Canner's Value
	Metric Tons	1,000 US$		Metric Tons	1,000 US$
Sardines in brine	723	112	Tuna in brine	69	33
Sardines in olive oil or sauce	18,214	9,642	Tuna in olive oil	833	695
Sardinelike fish in brine	1,995	587	Tunalike fish in olive oil	94	61
Sardinelike fish in oil	2,672	1,458	Other species (including shellfish)	560	293
Anchovies, rolled & fillets	1,036	1,111			
Continued in opposite column			Total	26,198	13,992

Note: Values converted to US$ equivalent on the basis of 28.75 escudos equal US$1.

(net weight). The September 1955 pack was 4,797 tons, about 17 percent higher than the 4,105 tons packed in August 1955.

Spain

FISHERY TRENDS, MARCH 1956: The coastal fishermen of Spain had a poor winter due to severe weather and the lack of fish in the coastal waters. The larger more seaworthy offshore vessels fared better and catches were about average for this period of the year.

The anchovies, which are important to both the fishermen and the canners, reappeared late in March in the northern fishing areas and helped to alleviate the economic depression of the coastal fishermen.

The general salary increases in Spain made effective by law on April 1, 1956 (5-6 percent for fishermen) will have little effect on the incomes of the fishermen because their income is largely based on a share of the value of the catch. The take-home pay of the fishermen is estimated to be between US$49.31 (1,500 pesetas) and US$65.72 (2,000 pesetas) a month, states an April 16 report from the United States Consul at Bilbao.

Sweden

CANNED SARDINES SOLD TO EAST GERMANY: Shipments of canned sardines to East Germany by the Swedish sardine factories in Bohuslan in 1956 totaled US$485,000 in value. The last delivery of sardines under the 1956 quota fixed by the Swedish-East German trade agreement was loaded in Stromstad on April 3, 1956, when three sardine factories in Stromstad together shipped 1,100,000 cans, representing a total value of US$116,000.

Under the trade agreement, shipments of sardines from Sweden to East Germany in 1957 may total US$872,000, but the Sardine Factories' Association does not yet know how much of this quota will be utilized, according to an April 5 dispatch from the United States Consulate at Goteborg.

Note: Values converted to US$ equivalents on the basis of 1 Swedish kroner equals US$0.194.

Union of South Africa

FISHERIES TRENDS, MARCH 1956: Fishing in Union of South African waters improved quantitatively and qualitatively in March 1956 as compared to a disappointing catch and seasonally poor quality the previous month. Fish canneries were not working to full capacity, but their output was said to be substantial.

Prices of fish oil improved; those of fish meal declined slightly during the month.

Spiny lobster production remains satisfactory, with overseas demand for canned packs firm. Export prices to the United States of South African frozen spiny lobster tails (large and medium) were reported to have increased over the past few

months to $1.05 per pound c.i.f. New York. Small sizes remained around 85 cents per pound c.i.f. New York, an April 5 dispatch from the United States Consular General at Capetown reports.

* * * * *

FISH STICK SALES PROMOTED BY INDUSTRY: One of the most important developments in the South African fishing industry during 1955 was the major effort to promote the sales of fish by means of Union-wide advertising and publicity, states the February 1956 South African Shipping News and Fishing Industry Review. This campaign, now in full swing, is doing much to make the people of South Africa more fish conscious. It has been conducted simultaneously with the development of quick-frozen fillets and fish sticks by a processing firm. Quick-frozen fish, and especially fish sticks, have caught the imagination of the housewife, and have brought another important product into the seafood field.

Much of the success of fish sticks, sales of which have increased many times over since their introduction just over a year ago, has been due to the invention of an appealing little "fishy character" which appears on every package of fish sticks. This character is becoming as well known to the South African child as Donald Duck.

In addition to the producer's brightly-colored packages, the character is to appear on key rings and in the form of children's decals and in a children's painting and story book. This attractively-produced book with its gay-colored cover is being sold over grocery and fish-shop counters. The text carries no direct advertising of fish sticks, which are not mentioned anywhere, but carries the advertising theme unerringly and with great subtlety into the home. Attractive window displays and effective point-of-sale advertising are also employed.

Along with national advertising in all the principal newspapers and periodicals, an editorial publicity campaign is being conducted by a public relations consultant. This seeks to bring new ways of using and preparing fish, especially quick-frozen fish, before the housewife by means of articles and recipes in the editorial pages of newspapers and magazines.

The South African firm recently gave a most successful lunch at a Cape Town hotel for the Cape Town columnists, women's page editors, and cookery writers. The dishes served consisted of quick-frozen fish and fish sticks. Films of aspects of trawling were shown to the guests before lunch.

The latest public relations development is a "Fishstick Bar" which will be an attraction at the Community Carnival at De Waal Park, Cape Town, this month. Cooked fish sticks will be sold to the many thousands expected to attend, the proceeds to go to the Community Chest.

It is hoped to use this "Bar" at other public occasions, including the "Home That South Africa Built" exhibition at Goodwood in April.

On the practical side of bringing fish sticks to the attention of the housewife, cookery demonstrators are being employed. They demonstrate to housewives cooking of fish sticks at shops in all the main centers.

United Kingdom

ELECTRONIC EYE FOR MID-WATER TRAWL: An electronic "eye" which may make mid-water trawls a commercial proposition is being used experimentally by the Hull trawler Benvolio. The equipment which can be lowered to the exact depth of a fish shoal has been used experimentally by the Benvolio during the last three months. "It is the first of its kind in the world. ...

"If its first implications are correct, it may well revolutionize fishing. In some cases it might double the catch," The Fishing News (February 10) states.

The manager of the trawler company's fishing industry branch claims the electronic eye can determine the depth of water under a ship; gauge the depth of any intervening shoals of fish; gauge the depth of the trawl; show what fish, if any, are going into the trawl; and show what fish are being missed in a horizontal direction. "You can easily describe it as a four-way eye," he said. "All depth readings are recorded in the wheelhouse. Early experiments have already proved most successful. To operate mid-water trawls successfully trawler skippers must know at what depth shoals are. We believe the eye answers the problem and it is a distinct commercial possibility."

The equipment will be available commercially at the end of this year. Rental cost for a one-year period is understood to be about US$840.

The British Ministry of Agriculture and Fisheries has been observing experiments with great interest. In addition, the Ministry has conducted its own experiments on Lake Windermere.

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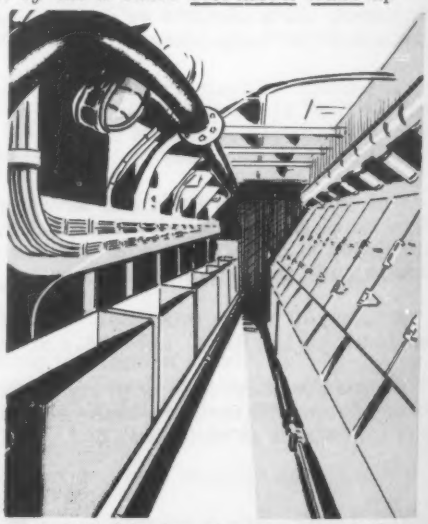
EXPERIMENTAL FREEZER-TRAWLER COMPLETES TRIP: The experiment in the quick freezing of fish at sea carried out by the trawler Northern Wave apparently has been successful.

The trawler left Grimsby, England, on December 31 and returned in January after spending eight days on the Norwegian fishing grounds. It was the vessel's first voyage since being equipped with special facilities for quick freezing, and a total catch of about 329,000 pounds was reported. Of this total about 70,000 pounds was quick frozen while the trawler was on the fishing grounds. This portion of the catch was thawed out and sent to inland dealers who were asked to report later on the reactions of customers.

The Northern Wave was chosen for experiments in quick-freezing at sea sponsored by the White Fish Authority and the British Trawlermen's Federation. The vessel carried a 23-man crew and three scientists from the Department of Scientific and Industrial Research who acted as instructors to the crew in how to handle the refrigeration machinery.



On the right of the above illustration is a bank of doors enclosing some of the quick-freeze compartments on the Northern Wave. On the left are the freezing cans into which the fish are placed for transfer to the cold storage room that is separately refrigerated by pipe grids at -20° F.

The experiment is designed to make the fishing grounds off Greenland and Newfoundland more accessible to British trawlers by enabling the boats to freeze the first part of the catch. At present the catch for the first few days' fishing on these grounds has been wasted due to spoilage. (United States Embassy in London, dispatch dated February 13 and the January 6 issue of The Fishing News, a British trade periodical.)

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LOANS TO FISHING INDUSTRY, 1954-55: The British White Fish Authority loans to fishing vessel owners for the 12 months ending March 31, 1955, increased sharply over the 12-month period ending March 31, 1954. Loans for the purchase of new vessels were US$1,725,000 and for the purchase of new engines amounted to US$56,000, according to a March 12 dispatch from the United States Embassy in London. During the year ending March 31, 1954, White Fish Authority loans for the purchase of fishing vessels were US$439,000, and for the purchase of engines US$19,000.

Total loans issued up to March 31, 1955, were US$2,240,000, and commitments outstanding on that date in respect to loans or balance of credits intimated were estimated to be US$2,484,000. Loans refunded and paid over to the Minister of Agriculture and Fisheries totaled US$78,000.

By March 31, 1955, applications for loans had been approved on 71 vessels between 70-140 feet in length, 154 vessels under 70 feet in length, and 118 engines for all craft up to 140 feet in length.

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MORE CANNED SALMON IN NEW BRITISH IMPORT QUOTAS CONCEDED TO JAPAN: New British import quotas conceded to Japan include additional canned salmon. The British have announced that provision is being made for additional trade over the next six months of about £150,000 (US$420,000) each way between Japan and Great Britain. The new quotas conceded for imports from Japan include additional canned salmon covering more than half the £150,000.

The British Government stated on April 17 in reply to a question in the House of Commons on Anglo-Japanese trade talks that the midterm review of the arrangements made in October 1955 revealed that the agreement was working satisfactorily, reports a United States Embassy dispatch (April 17) from London.

* * * * *

SCOTLAND'S SEAWEED INDUSTRY: Scotland's long sea coast with villages often at the head of the bays offers a profitable harvest of seaweed. Just how profitable it is can be seen from the fact that a new industry based on the products (alginate) derived from seaweed has been built up in Scotland. The products of this new industry are worth US$2.8 million a year. In 12 months more than 40,000 tons of seaweeds were harvested, reports the February 1956 South African Shipping News and Fishing Industry Review.

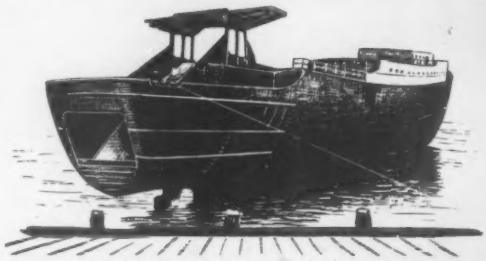
The seaweed industry existed to some extent before the last war, but emergency wartime needs of alginates forced a rapid expansion and since then research headed by the Government-sponsored Institute of Seaweed Research has found uses for alginates in food industries and cosmetics, in rubber, textiles, and dentistry.

About 10 million tons of seaweed have been located along Scotland's west coast that can be harvested at three-year intervals. Harvesting gives work to farmers who could not undertake full-time employment because of their own crops and cattle.

The seaweed is dried at drying stations dotted throughout the area and then processed at a number of small factories, often the only industry within many miles. As a result the British alginate industry, which ten years ago used only foreign seaweed now produces over a quarter of the total world production.

* * * * *

STERN TRAWL ADOPTED FOR NEW BOAT: Experiments by British inventors and trawling companies in the development of factory-type fishing trawlers have proven the practical value of the stern trawl, now in use on the factoryship Fairtry. The system of bringing the trawl up through a stern chute was developed to overcome the difficulties encountered in using the conventional side trawl on a highsided ship such as the Fairtry. The Fairtry, launched in 1953, has been reported to have been uniformily successful in bringing back good catches.



Stern view of Fairty. Note chests for trawl net and unusual athwartship gallows.

A new Fishing and Research Company has been formed to further the development of the stern trawl and experiments are being carried out on the Benvolio, the Hull trawler that has also been experimenting with an electronic mid-water trawl. This firm has placed an order for a new 255-foot stern trawling vessel which will be equipped with the new trawl.

In a summary of his impressions of the stern trawl and the advantage a distant-water vessel would have if equipped with one, one of the partners in the new Fishing and Research Company states: "The crew are under cover during the major part of the hauling operation and totally so during gutting and other processing work. Fewer men are needed on deck actually to guide the net aboard. Stern trawling is a more flexible system and with the new electronic mid-water trawl which has been developed, less damage is caused to the nets, together with bigger catches.

"In addition the ship gains more stability. It is therefore a better fishing platform and in heavy weather can continue on the fish since the vessel is headed into the wind with the trawl trailing over the stern.

"Side trawling for distant-water vessels is outmoded in the light of the new development. The future lies with the factory class of vessel where the whole catch is processed immediately. ..."

Redesigning the net gear was a corollary of the new trawling system. Among other improvements, the normal otter boards were replaced with "parotters." This type of otter board has curved surfaces which impart a far greater thrust to the mouth of the net without a resultant downward pull. Unlike the conventional otter boards they do not drag across the sea bed. The principal is the same as in the paravane designed for mine sweepers, according to the January 20 issue of The Fishing News, a British trade paper.

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TRAINING COURSES FOR FISHERMEN CONTINUED: Training courses for new recruits to the fishing industry have been organized at Hull, Grimsby, Lowestoft, Plymouth, and in Scotland. Additional courses to enable those already in the industry to improve their positions have also been organized At Grimsby, Hull, Fleetwood,

Lowestoft, Milford Haven, and in Scotland. The courses are under the direction of the local educational authorities with the Federal White Fish Authority donating maintenance grants and allowances, states a recent dispatch from the United States Embassy in London.

The rates of maintenance grants made by the White Fish Authority to those attending full-time training courses were raised in 1956 in accordance with increases granted recently by the Ministry of Labor for other industries. The White Fish Authority decided in 1955 to base its scales on those of the Ministry of Labor in order to encourage an extension of training in the white fish industry.

The new rates, effective January 2, 1956, range from 44s. (US$6.16) for a 15-year old trainee to 90s.(US$12.60) a week for those 20 years and older while living at home. The trainees living away from home are allowed between 30-60s. (US$4.20-8.40) for the ages 15 to 20 and over plus a lodging allowance up to a maximum of 40s. (US$5.60) a week. Married men or single men with dependents are allowed additional grants depending on the age of the trainee, age of the dependent, and the number of dependents.

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TRAWLERMEN SAY SUBSIDIZED ICELAND TRAWLERS MAY HURT THEM: Price competition with Icelandic fishermen when the ban on their landings in England is lifted (because of the high subsidy paid by Iceland to their trawlers) was referred to in a statement issued by the British Trawlermen's Federation and published in the March 9 issue of The Fishing News.

The subsidy is estimated at more than US$308 a fishing day, or about US$95,200 a year for each vessel. It is pointed out that if this same rate was paid to British trawlers it would cost US$25.2 million a year.

The statement continued: "Our British trawlers, which are not permitted to land in other foreign countries, even when they land in British ports are in the unhappy spot of competing with heavily-subsidized foreigners.

"Nevertheless we believe that a settlement can be worked out and we think we have so arranged the details of our proposals that they will be readily welcome in Iceland."

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WHALING BUOY WITH RADIO TRANSMITTER DEVELOPED: An English electronics firm has designed a whaling buoy incorporating a radio transmitter, to enable whaling factoryships to recover and process whales killed by the catcher vessels. This type of buoy, although developed for the whaling expeditions, could be used for other fisheries.

The radio buoys (with individual call signals) are carried by each catcher, and once a whale is harpooned the buoy is secured to it by a 20-fathom nylon line attached to a barb. The buoy is switched on by means of an external control on the casing and left floating beside the whale. The equipment within the buoy ensures that the transmitter operates for two minutes in every ten, transmitting between 1.7 and 2.1 megacycles a call sign in Morse and a long continuous signal for direction-finding purposes. The call sign and direction-finding signal are repeated four times. These periods of transmission are broken after two minutes to ensure that the buoys will radiate in this way for 22 hours on one battery charge. It is usual at this point for the catcher to radio the factoryship that a buoy has been secured to a whale, and to give the approximate position and the call signal of the buoy.

The functioning of the transmitter mechanism is entirely automatic, being controlled by a time switch. This time switch is wound before the buoy enters the water and is capable of running on one winding for between 7 and 10 days. A clockwork motor drives a pair of cams, one of which switches on the filaments of the valves approximately half a minute before switching on the high-tension voltage. At the same time the coding mechanism commences turning, and contacts open and close as the specially-cut coding cam radiates the assigned call sign.

The transmitter portion of the equipment contains two valves and is crystal-controlled, the whole assembly being mounted on rubber supports to ensure that valves and components are protected from sudden shocks. A meter is fitted on the main top plate to facilitate tuning the transmitter. The transmitter power needs are supplied by an accumulator housed at the foot of the buoy in which position its weight adds to the stability of the buoy. A range of up to 150 miles has been obtained in the Antarctic due principally to the absence of interference on the 2-megacycle band in that region, an April 6 dispatch from the United States Embassy in London states.

Venezuela

TUNA LONG-LINER LANDS GOOD TRIP: The long-liner Bozo Maru, operated by a Japanese crew and owned by a Venezuelan, landed 100 metric tons of tuna at La Guaira about the middle of March. The catch was made in 15 fishing days north of the island of Curacao. In a dispatch dated March 21, the United States Embassy at Caracas stated that 40 tons had been sold to wholesalers at La Guaira at about US$300 a ton.

The Japanese captain reported that a total of 408 tons of tuna had been caught in 45 fishing days by the Bozo Maru, since it began operations off Venezuela. The wholesalers announced that this fish would be placed on sale in Caracas fish markets at the price of US$1,050 a metric ton. The usual varieties of fresh fish are retailing at 61-68 U. S. cents a pound. Thus the tuna consumers will be getting fresh fish at 48 U. S. cents a pound.

DO YOU KNOW:

It has been estimated that there are anywhere from 20,000 to 40,000 different species of fishes in the world. While the exact number will, of course, never be known, ichthyologists generally agree that there are more than 20,000 known species, with about 100 new species being described each year.

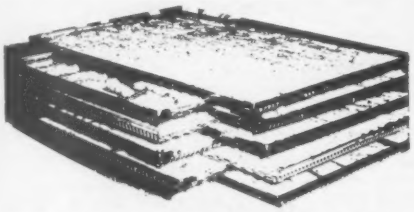
--Sea Secrets, The Marine Laboratory,
University of Miami, Coral Gables, Fla.

FEDERAL ACTIONS

Department of Agriculture

VOLUNTARY STANDARDS FOR FISH STICKS PROPOSED:

As the result of cooperative efforts by the fishing industry, the U. S. Department of the Interior, and the Department of Agriculture, quality standards



Trays of cooked fish sticks in Gloucester, Mass., plant ready for the packing table.

that have proved so valuable as a marketing aid for agricultural products will become available for fishery products.

The U. S. Department of Agriculture April 23, 1956, proposed issuance of United States Standards for grades of frozen fried fish sticks, the first to be formulated for this product.

Production of frozen fried fish sticks has increased rapidly since the product's appearance on the market in volume in 1953. Production in that year of approximately 7.5 million pounds increased to approximately 65 million pounds in 1955.

Funds made available by Public Law 466, "the Saltonstall-Kennedy Act," have been used to expedite the program of the Fish and Wildlife Service for the development of voluntary Federal standards. Frozen fried fish sticks were selected as the product of highest priority by the fishing industry. A committee of industry technologists, representative of fish stick producers and distributors, actively cooperated with the Service scientific staff in the studies of the product and of the processing procedures required to insure the development of a realistic and practical standard.

Also now in process of development are proposed standards for fish blocks (the raw material from which fish sticks are prepared), and frozen raw breaded shrimp.

In order to fully utilize the existing facilities and personnel within the Federal Government, the U. S. Department of the Interior has joined with the U. S. Department of Agriculture to develop, establish, and implement the standardization program for fishery products. The U. S. Department of the Interior will conduct all research, conferences, and meetings required to develop or revise standards. The standards will then be transmitted to the U. S. Department of Agriculture with the recommendation that it promulgate them. When they become effective, the U. S. Department of Agriculture will offer an inspection and certification service on a fee basis upon request by any financially interested party. Such inspections would aid in quality controls and in facilitating the marketing of the product.

The proposed standard for frozen fried fish sticks applies to whole rectangular-shaped portions of fish meat, breaded, precooked, and frozen. It is recommended that the "largest dimension" (length) of the sticks be at least three times that of the "next largest dimension" (width), and that the average weight of the individual sticks be not less than $\frac{3}{4}$ ounce and not greater than $1\frac{1}{4}$ ounces. The grades proposed include "U. S. Grade A" and "U. S. Grade B." Quality below these grades would be classified as "Substandard."

Technical requirements for ascertaining quality include the factors of: flavor

and odor; appearance as to size uniformity, color, and coating; defects; such character elements as ease of separation, wholeness, freedom from oiliness or crumbliness in the coating; tenderness and moistness of the meat, and the consistency and adherence of the coating on the heated product.

The proposal does not define proper labeling nomenclature for this product. Frozen fried fish sticks when sold in interstate commerce are required to conform to the labeling regulations of the Food and Drug Administration, U. S. Department of Health, Education and Welfare.

Interested persons have until June 26, 1956, in which to submit views or comments on the proposed standards for grades to the Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25, D. C.

The proposed standard for fish sticks as it appeared in the April 26, 1956 Federal Register follows:

FROZEN FRIED FISH STICKS

UNITED STATES STANDARDS FOR GRADES [1]

NOTICE OF PROPOSED RULE MAKING

Notice is hereby given that the United States Department of Agriculture is considering the issuance of United States Standards for Grades of Frozen Fried Fish Sticks pursuant to the authority contained in the Agricultural Marketing Act of 1946 (60 Stat. 1087 et seq., as amended; 7 U. S. C. 1621 et seq.). These proposed grade standards are recommended by the Fish and Wildlife Service, U. S. Department of Interior, based on data developed by that agency. This proposal, if made effective, will be the first issue by the Department of grade standards for this product.

All persons who desire to submit written data, views or arguments for consideration in connection with the proposed standards should file the same with the Chief, Processed Products Standardization and Inspection Branch, Fruit and Vegetable Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25, D. C., not later than 60 days after publication hereof in the FEDERAL REGISTER.

The proposed standards are as follows:

PRODUCT DESCRIPTION, AND GRADES

Sec.
52.3141 Product description.
52.3142 Grades of frozen fried fish sticks.

WEIGHTS AND DIMENSIONS

52.3143 Recommended weights and dimensions.

FACTORS OF QUALITY

52.3144 Ascertaining the grade for frozen fried fish sticks.
52.3145 Ascertaining the score for the factors which are rated.
52.3146 Appearance.
52.3147 Defects.
52.3148 Character.

LOT CERTIFICATION TOLERANCES

52.3149 Tolerances for certification of officially drawn samples.

SCORE SHEET

52.3150 Score sheet for frozen fried fish sticks.

AUTHORITY: §§ 52.3141 to 52.3150 issued under sec. 205, 60 Stat. 1090, as amended; 7 U. S. C. 1624.

[1] Compliance with these standards does not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

PRODUCT DESCRIPTION AND GRADES

§ 52.3141 *Product description.* Frozen fried fish sticks are clean, wholesome, rectangularly-shaped portions of breaded, pre-cooked, and frozen fish flesh. The portions of fish flesh, composed primarily of large pieces, are coated with a suitable batter and breading; are cooked by frying in suitable oil or fat; and are frozen in accordance with good commercial practice and maintained at temperatures necessary for the preservation of the product. Frozen fried fish sticks contain not less than 60 percent, by weight, of fish flesh. All sticks comprising an individual package are prepared from the flesh of only one species of fish.

§ 52.3142 *Grades of frozen fried fish sticks.* (a) "U. S. Grade A" is the quality of frozen fried fish sticks that possess a good flavor and odor, that possess a good appearance, that are practically free from defects, that possess a good character, and that for those factors which are rated in accordance with the scoring system outlined in this subpart the total score is not less than 85 points: *Provided*, That the frozen fried fish sticks may possess a reasonably good appearance and a reasonably good character if the total score is not less than 85 points.

(b) "U. S. Grade B" is the quality of frozen fried fish sticks that possess a reasonably good flavor and odor, that possess a reasonably good appearance, that are reasonably free from defects, that possess a reasonably good character, and that for those factors which are rated in accordance with the scoring system outlined in this subpart the total score is not less than 70 points: *Provided*, That the frozen fried fish sticks may fail to possess a reasonably good appearance and fail to possess a reasonably good character if the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen fried fish sticks that fail to meet the requirements of U. S. Grade B.

WEIGHTS AND DIMENSIONS

§ 52.3143 *Recommended weights and dimensions.* The recommended weights and dimensions of frozen fried fish sticks are not incorporated in the grades of the finished product since weights and dimensions, as such, are not factors of quality for the purposes of these grades. It is recommended that the largest dimension of a fish stick be at least three times that of the next largest dimension and that the average weight of the individual sticks be not less than ¾ ounce and not greater than 1¼ ounces.

FACTORS OF QUALITY

§ 52.3144 *Ascertaining the grade—*

(a) *General.* In addition to considering other requirements outlined in the standards, the following quality factors are evaluated in ascertaining the grade of the product:

(1) *Factor not rated by score points.*
(i) Flavor and odor.

(2) *Factors rated by score points.* The relative importance of each factor which is rated is expressed numerically on the scale of 100. The maximum number of points that may be given such factors are:

Factors:	Points
Appearance	35
Defects	40
Character	25
Total score	100

(b) The grade of frozen fried fish sticks is ascertained by observing the product in the frozen state and after it has been heated in a suitable manner.

(c) *Percent of fish flesh.* "Percent of fish flesh" means the average percent, by weight, of fish flesh in an individual package.

(d) *Good Flavor and odor.* "Good flavor and odor" means that the product has the good flavor and odor of properly prepared breaded fish sticks. The flesh portion has the good flavor and odor of properly prepared fish of the particular species. The coating has the good flavor and odor obtained when all components have been properly prepared, used, and maintained. The product is free from rancidity, bitterness, and staleness, from bacterial spoilage flavors and odors, and from off-flavors and off-odors of any kind.

(e) *Reasonably good flavor and odor.* "Reasonably good flavor and odor" means that the product may be somewhat lacking in good flavor and odor, but is free from rancidity and from objectionable bacterial spoilage flavor, and from off-flavors and off-odors of any kind.

(f) *Heating in a suitable manner.* "Heating in a suitable manner" means heating in accordance with the recommendations accompanying the product. However, if specific instructions are lacking the product should be heated as follows:

(1) Place the product while still in the frozen state on a flat or shallow pan of sufficient size that at least 10 ounces of the product can be spread evenly on the pan with no portion of a stick closer than ¼ inch to another or to the edge of the pan.

(2) Place the pan and frozen contents in a properly ventilated oven pre-heated to 400 degrees Fahrenheit and remove when the product is thoroughly heated.

§ 52.3145 *Ascertaining the score for the factors which are rated.* The essential variations within each factor which is rated are so described that the value may be ascertained for each factor and expressed numerically. The numerical range within each factor which is rated is inclusive. (For example, "21 to 25 points" means 21, 22, 23, 24, or 25 points).

§ 52.3146 *Appearance*—(a) *General.* The factor of appearance refers to the uniformity of size and shape of the frozen sticks, the color of the heated sticks, and the continuity of the coating of the product after heating.

(b) (*A*) *classification.* Frozen fried fish sticks that possess a good appearance may be given a score of 30 to 35 points. "Good appearance" means that the sticks are practically uniform in size and shape; that the product after heating possesses a practically uniform light brown to golden brown color or reddish-brown color characteristic of properly prepared frozen fried fish sticks; and that the sticks, after heating, possess a continuity of the coating not more than slightly affected by cracking or slipping.

(c) (*B*) *classification.* Frozen fried fish sticks that possess a reasonably good appearance may be given a score of 25 to 29 points. "Reasonably good appearance" means that the sticks are reasonably uniform in size and shape; that the product after heating possesses a reasonably uniform light brown to golden-brown color or reddish-brown color characteristic of properly prepared frozen fried fish sticks; and that the sticks, after heating, possess a continuity of the coating not materially affected by cracking or slipping.

(d) (*SStd.*) *classification.* Frozen fried fish sticks which fail to meet the requirements of paragraph (c) of this section may be given a score of 0 to 24 points, and shall not be graded above U. S. Grade B regardless of the total score of the product (this is a partial limiting rule).

§ 52.3147 *Defects*—(a) *General.* The factor of defects refers to the degree of freedom from bones, broken sticks, damaged sticks, and from blemishes.

(1) *Bones.* "Bones" means any bones that can be separated from the product, can be identified, and are of such character as to be potentially harmful.

(2) *Broken stick.* "Broken stick" means a fish stick which is separated in two or more parts or is strained apart to the extent that it cannot be readily handled as one stick.

(3) *Damaged stick.* "Damaged stick" means a fish stick which has been crushed or otherwise mutilated to the extent that its appearance is materially affected.

(4) *Blemished.* "Blemished" means the presence (in or on the fish flesh) of blood spots, bruises, skin, protein curd spots, and objectionable dark layer fat, and (on or in the coating) of burned material, dark carbon specks, and other harmless extraneous material.

(5) *Seriously blemished.* "Seriously blemished" means blemished to the extent that the appearance is seriously affected.

(b) (*A*) *classification.* Frozen fried fish sticks that are practically free from defects may be given a score of 34 to 40 points. "Practically free from defects" means that:

(1) None of the sticks are broken;

(2) The sticks may be blemished to only a minor degree; and

(3) Not more than a total of 20 percent, by count, of the sticks may be damaged or contain bones: *Provided,* That bones may be present in not more than 10 percent, by count, of all the sticks.

(c) (*B*) *classification.* Frozen fried fish sticks that are reasonably free from defects may be given a score of 28 to 33 points. Frozen fried fish sticks that fall into this classification may not be graded above U. S. Grade B regardless of the total score for the product (this is a limiting rule). "Reasonably free from defects" means that not more than a total of 30 percent, by count, of the sticks may be defective because of bones, or are damaged sticks, broken sticks, or seriously blemished sticks: *Provided,* That

(1) Not more than 10 percent, by count, may be broken sticks;

(2) Not more than 30 percent, by count, may be damaged sticks;

(3) Not more than 20 percent, by count, of the sticks may contain bones; and

(4) Not more than 10 percent, by count, of the sticks may be seriously blemished.

(d) (*SStd.*) *classification.* Frozen fried fish sticks that fail to meet the requirements of paragraph (c) of this section may be given a score of 0 to 27 points, and may not be graded above substandard regardless of the total score for the product (this is a limiting rule).

§ 52.3148 *Character*—(a) *General.* The factor of character refers to the presence or absence of free oil in the package and its effect on the condition of the package; the ease of separating the frozen sticks without damaging the coating or breaking the sticks; the tendency of the sticks to remain whole and unbroken when they are heated, handled, and served in the normal manner; the degree of freedom of the breading from either an oiliness or crumbliness; the tenderness and moistness of the flesh; the consistency of the breading in the heated product; and the adherence of the coating of the heated product.

(b) (*A*) *classification.* Frozen fried fish sticks that possess a good character may be given a score of 21 to 25 points. "Good character" means that oil from the product does not more than slightly damage the package; that there may be present not more than a very small amount of loose breading in the package; that the sticks may be separated easily; that the sticks are not more than very slightly damaged by the normal handling incident to heating and serving; that no excess oil remains on the cooking utensil; that the breading is not more than slightly oily; that the flesh after heating has a good texture which is firm, tender and moist, characteristic of properly fried fish sticks for the species used; and that after heating the coating has a good crisp, tender texture not more than slightly affected by blistering or wrinkling.

(c) (*B*) *classification.* Frozen fried fish sticks that possess a reasonably good character may be given a score of 17 to 20 points. "Reasonably good character" means that oil from the product does not materially damage the package; that there may be present not more than a reasonable amount of loose breading in the package; that the sticks may be separated with only moderate damage to the coating; that the sticks are not more than moderately damaged by the normal handling incident to heating and serving; that the breading is not more than moderately oily; that the flesh after heating has a reasonably good texture which is not more than moderately tough, stringy, crumbly, mushy or spongy; and that after heating the coating has a reasonably good texture which may be not more than moderately pasty, mushy, tough, or crumbly and is not materially affected by blistering or wrinkling.

(d) (*SStd.*) *classification.* Frozen fried fish sticks that fail to meet the requirements of paragraph (c) of this section may be given a score of 0 to 16 points and shall not be graded above U. S. Grade B regardless of the total score for the product (this is a partial limiting rule).

LOT CERTIFICATION TOLERANCES

§ 52.3149 *Tolerances for certification of officially drawn samples.* (a) The grade of a specific lot from which samples have been officially drawn may be certified on the basis of such samples: *Provided,* That (1) all packages contain one species of fish; (2) all packages meet applicable provisions of the Federal Food, Drug, and Cosmetic Act in effect at the time of the aforesaid certification: *And provided further,* That, with respect to those factors which are rated by score points, such grade will be determined by averaging the total scores, if:

(i) Not more than one-sixth of the packages fail to meet the grade indicated by the average of such total scores;

(ii) None of the packages fall more than one grade below the grade indicated by the average of such total scores; and

(iii) The average score of all packages for any factor subject to a limiting rule is within the score range of that factor for the grade indicated by the average of the total scores of the packages comprising the sample.

SCORE SHEET

§ 52.3150 *Score sheet for frozen fried fish sticks.*

Label		
Size and kind of container		
Species of fish		
Container mark or identification		
Size of lot		
Number of samples		
Net weight (oz.)		
Number of sticks per container		

Factors		Score points
Appearance	35	(A) 30-35 (B) 25-29 (SStd.) [1] 0-24
Defects	40	(A) 34-40 (B) [2] 28-33 (SStd.) [1] 0-27
Character	25	(A) 21-25 (B) 17-20 (SStd.) [1] 0-16
Total score	100	

Grade	
Flavor	

[1] Indicates partial limiting rule.
[2] Indicates limiting rule.

Dated: April 23, 1956.

[SEAL] ROY W. LENNARTSON,
Deputy Administrator,
Marketing Services.

Department of the Interior

FISH AND WILDLIFE SERVICE

REGULATIONS FOR SALMON FISHING BOATS AND GEAR:

Due to the continued increase of the movement of mobile salmon boats from area to area in Alaska, it has been determined that such movement must be curtailed in the interests of sound conservation. An amendment to section 102.8 of the Alaska Commercial Fisheries Regulation was announced on April 4 by Acting Secretary of the Interior Clarence A. David. The amendment to section 102.8, effective immediately, as published in the Federal Register follows:

§ 102.8 *Registration of boats and gear.* (a) Each year, 30 days prior to the opening of any fishing season in any regulatory area as defined herein, the units of gear and all boats intended to be used in fishing in such area shall be registered for the regulatory area of proposed operation and for no other. Such registration shall be made with the local representative of the Fish and Wildlife Service. No person shall be permitted to register any gear or boat so as to permit his fishing for salmon, except by trolling, in more than one regulatory area during the calendar year. Such registration shall include the furnishing of information on the size, type, crew, gear, and identity of boats, the name and address of any and all fishermen who will fish with such gear or boat, and the fishery (salmon, crab, etc.) in which such gear, boat or fisherman intends to operate. When registration plates are furnished for boats, such plates shall be displayed in a prominent place on the port side. No gear or boat which has not been registered as required herein shall be permitted to engage in any fishery.

(b) No gear or boat fishing for salmon, but not including trolling lines and boats fishing with such excepted gear, which has been registered for fishing in a designated regulatory area, may thereafter be used for fishing in any other area, nor may any person or persons other than the person or persons designated in the original registry fish such boat or gear, except that substitutions in crew members or gear operators may be made with the approval of the local representative where such substitutions are made for the purpose of replacing fishermen who become ill or are otherwise removed from the fishery.

(c) Salmon trolling gear and boats and all other gear and boats used in fishing for species other than salmon may change their operations from one regulatory area to another and from such other fishery to salmon fishing, but only after such proposed change has been reported to a local representative of the Fish and Wildlife Service in advance of such change.

(d) Registration of boats and gear shall not be required of any boat engaging solely in the halibut fishery.

(e) Registrations subsequent to the specified time of registration and changes in area of fishing operation may be permitted to avoid unusual hardships and for other good cause provided such registrations and changes are consistent with needs of fishery conservation in the affected area. For the purpose of this section only, the following regulatory areas or combinations of regulatory areas are considered to be single regulatory areas:

(1) Bristol Bay area.
(2) Aleutian Islands-Alaska Peninsula-Chignik areas.
(3) Kodiak area.
(4) Cook Inlet-Resurrection Bay areas.
(5) Prince William Sound-Copper River-Bering River-Yakataga areas.
(6) Yakutat area.
(7) Southeastern Alaska area.

(f) For the 1956 season only, registration for the Copper River area shall not be made less than 15 days prior to the opening of the fishing season.

Eighty-Fourth Congress (Second Session)

Public bills and resolutions that directly or indirectly affect the fisheries and allied industries are listed--they are shown when introduced; then from month to month the more pertinent reports, hearings, or chamber actions on the bills listed are indicated; and bills, if passed, are then shown again when signed by the President.

COMMERCIAL FISHERIES EDUCATIONAL PROGRAM: S. 2379 (Payne) introduced in the First Session of this Congress, a bill to promote the fishing industry in the United States and its Territories by providing for the training of needed personnel for such industry. Reported to the Senate by the Committee on Interstate and Foreign Commerce on May 17 (S. Rept. 2014).

Senate Report No. 2014, Providing for the Training of Personnel for the Fishing Industry (May 17, 84th Congress, 2nd Session), to accompany S. 2379, 10 pp., printed. Explains the amendments, gives the background and need for the legislation, presents the Department of the Interior's Report, explains the allocation of funds under the bill, and indicates the changes in the Vocational Education Act of 1946.

Also H. R. 10433 (McCormack) introduced into the House April 11, 1956; a bill to promote the fishing industry in the United States and its territories by providing for the training of needed personnel for such industry; to the House Committee on Merchant Marine and Fisheries. Proposes a program of federal grants to colleges and universities for the training of technicians and other professional personnel in the field of commercial fishing. It authorizes an appropriation of $550,000 annually for distribution by the Secretary of the Interior to colleges and universities. Also amends the Vocational Education Act of 1946 to authorize the appropriation of $375,000 annually for vocational education in the fishing trades. Same as S. 2379.

COMMERCIAL FISHERIES NATIONAL POLICY AND FISHERIES COMMISSION: S. 3275 (amended) was reported favorably with amendments to the Senate on May 17 (S. Rept. 2017) by the Senate Committee on Interstate and Foreign Commerce. Provides for the establishment of the independent National Fisheries Commission in the Department of Interior, composed of five members, the chairman to be the Assistant Secretary of Interior for Fisheries. Not more than three members can be of the same political party and they will be appointed by the President and must be confirmed by the Senate. The President will designate the chairman. At least three of the commissioners shall be experienced in the fishing industry, and two shall be from the area west of the Mississippi River, and two from the area east of it. While the Commission is placed in the Interior Department, it will operate independently as to all policy matters. The measure also provides that the Fish and Wildlife Service will become the Wildlife Service of the Department and all funds and functions of the fishery section of the present service will be transferred to the new commission.

The Commission is charged with promoting the welfare of the fishing industry, keeping a continuing investigation going of the flow to market of fish and fishery products, and also follow closely the importation of foreign fish and its effect upon the domestic market.

The bill creates in the Department a fisheries division which is charged with the administration of policies developed by the Commission relating to fisheries. This would include development, advancement, management, conservation, and protection of the Nation's fisheries. The Chairman of the Commission, in his position as Assistant Secretary, will head the division.

The Fisheries Commission would be required to be represented at all conferences with foreign governments in which the State Department participates and the Secretary of State is directed to name one member of the Fisheries Commission as a member of all United States Delegations taking part in such international fisheries conferences.

The Commission would be required to cooperate with the States in promotion of their fisheries programs and with other governmental, private nonprofit, and other organizations and agencies in any problems arising out of administering the Act. The Commission also must be represented in any tariff negotiations affecting the fish industry.

The bill directs that the Fisheries Division of the Interior Department shall be the administrative organization and the Fisheries Commission the policy-making body.

The Commission is required to make periodical reports to Congress and recommendations for legislation to aid the fishing industry. It is prohibited from interfering with the fishery programs of any state, interstate compacts, and international commissions established by treaty. It would have complete jurisdiction over all fishery problems, whales, sea lions, and hair seals.

Senate Report No. 2017, Fisheries Act of 1956 (May 17, 1956, 84th Congress, 2nd Session), to accompany S. 3275, 7 pp., printed. Discusses field investigations, hearings conducted by the Committee, drafting of fisheries bill S. 3275, revision of S. 3275, and the reported bill section by section. Also includes a list of organizations and individuals other than Senators who have advocated and endorsed the amended substitute of S. 3275.

Amended substituted S. 3275 (Magnuson, Saltonstall, Kennedy, Green, Bush, Flanders, Butler, Beall, Smathers, Johnston of S. C., Sparkman, Hill, Eastland, Stennis, Humphrey, Murray, Kuchel, Jackson, George, Knowland, Schoeppel, Chavez, Duff, Payne, Bible, Monroney, Neuberger, Potter, Kefauver, Lehman, Malone, Pastore, Purtell, Ives, and Mansfield), reported to the Senate May 17. The bill as printed would establish a sound and comprehensive national policy with respect to the development, conservation for preservation, management and use of fisheries resources; create and prescribe the functions of the United States Fisheries Commission; and for other purposes; referred to the Senate Committee on Interstate and Foreign Commerce.

H. R. 10746 (King of California) introduced in the House April 23 proposes to establish a sound and comprehensive national policy with respect to the fisheries; to create and prescribe the functions of the United States Fisheries Commission; to strengthen the fisheries segment of the national

economy; and for other purposes; to the Committee on Merchant Marine and Fisheries. Establishes under the Department of the Interior a five-member United States Fisheries Commission with broad powers for fisheries.

Also introduced April 24: H. R. 10755 (Bates), H. R. 10760 (Colmer), H. R. 10770 (Miller of Md.); introduced April 25: H. R. 10784 (Bennett of Fla.), H. R. 10792 (Fascell), H. R. 10793 (Kilgore), H. R. 10797 (Sikes), H. R. 10810 (Rogers of Fla.), H. R. 10813 (Thompson of La.); April 26: H. R. 10845 (Wilson of Calif.); April 27: H. R. 10874 (Cramer), H. R. 10888 (Thompson); April 30: H. R. 10907 (Magnuson), H. R. 10910 (Pelly); May 2: H. R. 10953 (Herlong); May 3: H. R. 10995 (Donohue); May 8: H. R. 11089 (Willis); all referred to the House Committee on Merchant Marine and Fisheries, and all similar to H. R. 10746. These bills are substitutes for H. R. 9552 and the original S. 3275, and other bills on this subject introduced earlier this session in the House.

FISHERIES DIVISION IN DEPARTMENT OF INTERIOR: S. 3694 (Kennedy, Saltonstall, Mrs. Smith of Maine, & Payne), introduced in the Senate April 23, proposes to reorganize the Department of the Interior by establishing a Fisheries Division in such Department under an additional Assistant Secretary of the Interior; referred to the Senate Committee on Government Operations. This bill would establish within the Interior Department a Fisheries Division, with the functions under the direction and supervision of the Secretary of the Interior by an additional Assistant Secretary of the Interior appointed by the President and confirmed by the Senate. All functions, powers, duties, and authority of the Fish and Wildlife Service related primarily to fish, fisheries, and related matters would be transferred to the Fisheries Division. The present Fish and Wildlife Service would hereafter be known as the Wildlife Service. Also, the bill would authorize the Secretary of the Interior to appoint an advisory committee of the American fisheries industry to assist him in formulating national fisheries policy, with the committee composed of not more than 11 members to nearly as possible represent all segments of the industry.

Also H. R. 11185 (McIntire) introduced in the House May 14, a bill to reorganize the Department of the Interior by establishing a Commercial Fisheries Division under an additional Assistant Secretary of the Interior to exercise all functions having to do with commercial fisheries, now carried on by branches of Fish and Wildlife Service of such Department; to the Committee on Merchant Marine and Fisheries.

FISH HATCHERIES: S. 3831 (Laird) introduced in the Senate May 10, 1956, a bill to provide for a fish hatchery in the State of West Virginia; May 9: S. 3809 (Carlson), a bill to provide for the establishment of a new fish hatchery at Cedar Bluff Reservoir; both to the Committee on Interstate and Foreign Commerce.

Introduced in the House April 30, H. R. 10906 (Mrs. Kee), a bill to provide for a fish hatchery in West Virginia; May 3: H. R. 11012 (Smith of Kansas), a bill to provide for the establishment of a new fish hatchery on Cedar Bluff Reservoir, Trego County, Kans.; both to the Committee on Merchant Marine and Fisheries.

Reported to the House favorably by the Committee on Merchant Marine and Fisheries on May 2, H. R. 8810 (amended), authorizing the Secretary of the Interior to construct, equip, maintain, and operate a new fish hatchery in the vicinity of Miles City, Mont. (H. Rept. 2103); and H. R. 9822 (amended), to provide for the establishment of a trout hatchery on the Davidson River in the Pisgah National Forest in North Carolina (H. Rept. 2097).

House passed with amendments on May 7, H. R. 8810 and H. R. 9822, authorizing the Secretary of the Interior to construct, maintain and operate new fish hatcheries at Miles City, Mont., and Pisgah National Forest in North Carolina.

H. R. 8810, to provide for the establishment of a new fish hatchery at Miles City, Mont., reported to the Senate on May 14 by the Senate Committee on Interstate and Foreign Commerce (S. Rept. 1969).

GENERAL AGREEMENT ON TARIFFS AND TRADE: H. Res. 459 (Bailey) and H. Res. 460 (Hale) introduced in the House April 10, 1956; a resolution authorizing the Committee on Ways and Means to investigate and study the General Agreement on Tariffs and Trade; to the Committee on Rules.

GREAT LAKES FISHERIES CONVENTION: The Committee on Interstate and Foreign Commerce on April 25 reported favorably to the Senate S. 3524, to give effect to the Convention on Great Lakes Fisheries signed at Washington September 10, 1954, with amendments (S. Rept. 1858).

Senate Report No. 1858, Great Lakes Fishery Act of 1956 (April 25, 1956, 84th Congress 2nd Session) to accompany S. 3524, 3 pp., printed. Discusses the purpose of the bill and the amendments.

Passed by the Senate on April 30 with amendment and cleared for the House S. 3524, to give effect to the Convention on Great Lakes Fisheries.

S. 3524, to give affect to the convention on Great Lakes fisheries, reported to the House on May 14 by the House Committee on Merchant Marine and Fisheries (H. Rept. 2154).

INTERIOR APPROPRIATIONS: The Senate Committee on Appropriations in executive sessions on April 17, 1956, ordered favorably reported with amendments H. R. 9390, fiscal 1957 appropriations for Interior Department and related agencies (including the Fish and Wildlife Service). The bill was reported to the Senate by the Committee April 18 (S. Rept. 1761).

Senate Report No. 1761, Interior Department and Related Agencies Appropriation Bill, 1957 (April 17, 1956, 84th Congress, 2nd Session), to accompany H. R. 9390, 32 pp., printed. Contains a summary of the bill by agency and a comparative statement of the appropriations for 1956 and the estimates for 1957.

Fish and Wildlife Service increases included, among others, under "management of resources," $100,000 for the fish hatchery program; under "investigation of resources," $40,000 for Great Lakes fisheries research.

Senate passed with amendments on April 23, H. R. 9390 fiscal 1957 appropriations for Interior Department and related agencies (including the Fish and Wildlife Service), after adopting amendments. The bill was scheduled for conference with the House.

ORGANIZATION FOR TRADE COOPERATION (OTC): The House Ways and Means Committee gave its approval on March 26 to the OTC bill, H. R. 5550 (Cooper), introduced April 14, 1955, with certain amendments intended to define and limit United States activities under the OTC. After the report of the Ways and Means Committee is filed, it will be in order for the Committee to request a rule providing for House consideration of the OTC bill.

The Committee on Ways and Means filed in the House a report on "The Agreement on Organization for Trade Cooperation" (H. Rept. 2007).

PROTECTION OF WALRUSES: S. 3778 (Watkins) introduced into the Senate May 7, 1956; a bill to amend the act for the protection of Walruses; to the Senate Committee on Interior and Insular Affairs.

Also H. R. 10412 (Bartlett) introduced into the House April 11, 1956; to the House Committee on Interior and Insular Affairs; similar to S. 3778.

Both bills would amend the Walrus Protection Act of August 18, 1941, to permit the taking of one bull walrus per year by a licensed nonnative hunter provided the hunter is accompanied by a native guide and the meat is given to the natives. Authorizes the Secretary of the Interior to prohibit the taking of walruses by nonnatives whenever he determines the food supply of the natives is endangered.

H. R. 10412, to amend the act for the protection of walruses; reported favorably on May 9 by the Subcommittee to the House Committee on Interior and Insular Affairs.

SHELLFISH RESEARCH LABORATORY: S. 3827 (Butler) introduced in the Senate May 9, 1956; a bill to authorize the construction of a shellfish research laboratory and experiment station in the Chesapeake Bay area; to the Senate Committee on Interstate and Foreign Commerce.

Also H. R. 11186 (Miller of Md.) introduced in the House May 14; to the House Committee on Merchant Marine and Fisheries. Similar to S. 3827.

WATER POLLUTION: Subcommittee on Rivers and Harbors reported favorably to the House Committee on Public Works H. R. 9540 (amended) to extend and strengthen the Water Pollution Control Act.

H. R. 9540 (Amended), ordered favorably reported to House on May 17, by the Committee on Public Works.

FISHERIES LEGISLATION (Hearings before the Senate Committee on Interstate and Foreign Commerce, Eighty-Fourth Congress, Second Session, on S. 2379, a bill to promote the fishing industry in the United States and its territories by providing for the training of needed personnel for such industry; S. 3275, a bill to establish a sound and comprehensive national policy with respect to the development, conservation for preservation, management, and use of fisheries resources, to create and prescribe the functions of the United States Fisheries Commission, and for other purposes; S. 3339, a bill to provide for the stabilization of the domestic fisheries industry in the United States through the creation of a fisheries stabilization corporation, to bring about a better balanced flow of fish and shellfish and the products thereof in interstate and foreign commerce, and for other purposes; March 19, 20, 21, 22, 23, and 26, 1956), 304 pp., printed. Presents the statements of the various witnesses as well as written statements submitted and letters, telegrams, and memoranda received by the Committee regarding the bills indicated; the reports from Agriculture, Commerce, Interior, and State departments, and the General Accounting Office; a resolution from "Farmers of the Sea" Fishing Committee; and newspaper and magazine articles and press releases on fisheries legislation.

PACIFIC COAST AND ALASKA FISHERIES: (Hearings before the Senate Committee on Interstate and Foreign Commerce, Eighty-Fourth Congress, Second Session, pursuant to S. Res. 13, a resolution to investigate certain problems relating to interstate and foreign commerce, October 10, 11, 14, 15, 17, 18, 19, and 31, November 2 and 3, and December 5, 1955), 659 pp., printed. Presents oral statements of witnesses, written statements, letters, articles, documents, etc., and Senate Interstate and Foreign Commerce Committee staff reports dated July 1 and 6, 1955.

Editorial Assistant--Ruth V. Keefe Illustrator--Gustaf T. Sundstrom

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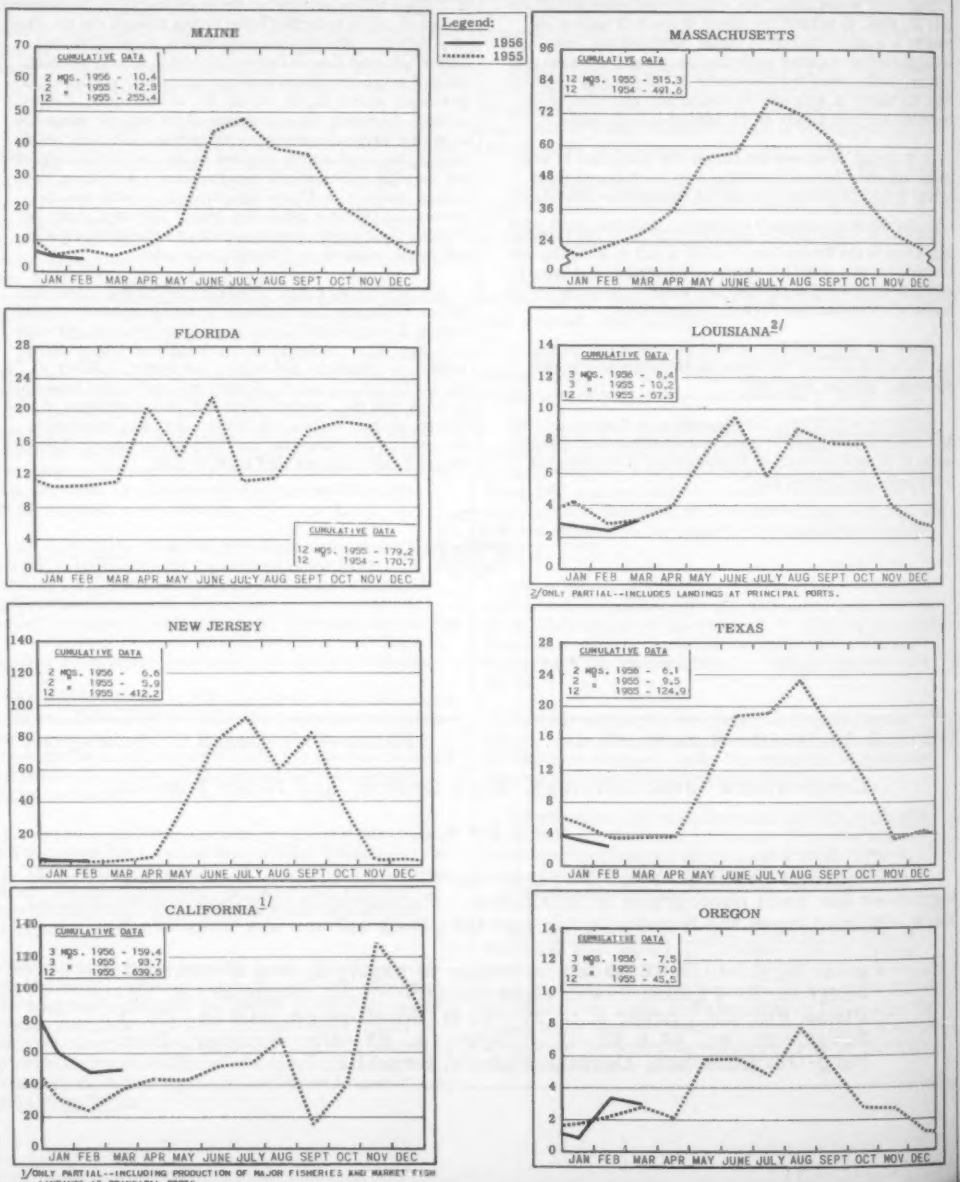
FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

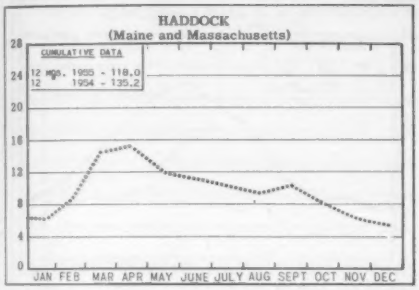


1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

2/ONLY PARTIAL--INCLUDES LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds


HADDOCK
(Maine and Massachusetts)
CUMULATIVE DATA
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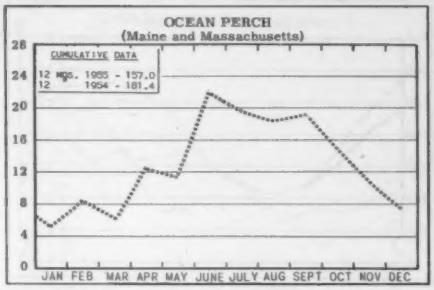
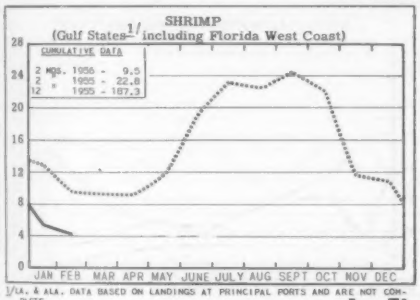
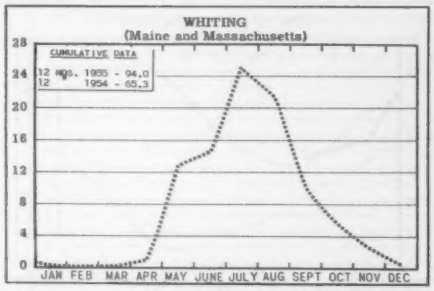
12 " 1954 - 135.2
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


OCEAN PERCH
(Maine and Massachusetts)
CUMULATIVE DATA
12 MOS. 1955 - 157.0
12 " 1954 - 181.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

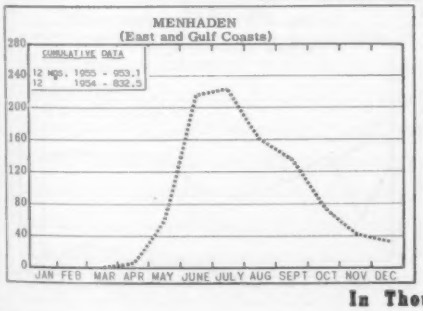
In Millions of Pounds

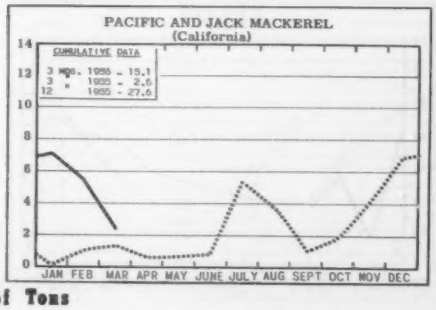

SHRIMP
(Gulf States 1/ including Florida West Coast)
CUMULATIVE DATA
2 MOS. 1956 - 9.5
2 " 1955 - 22.8
12 " 1955 - 187.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

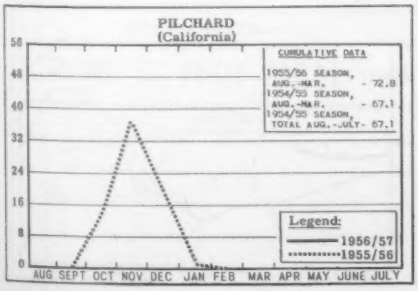

WHITING
(Maine and Massachusetts)
CUMULATIVE DATA
12 MOS. 1955 - 94.0
12 " 1954 - 65.3
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

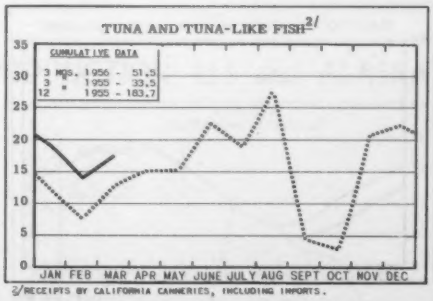
In Thousands of Tons


MENHADEN
(East and Gulf Coasts)
CUMULATIVE DATA
12 MOS. 1955 - 953.1
12 " 1954 - 832.5
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC


PACIFIC AND JACK MACKEREL
(California)
CUMULATIVE DATA
3 MOS. 1956 - 15.1
3 " 1955 - 2.6
12 " 1955 - 27.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

In Thousands of Tons

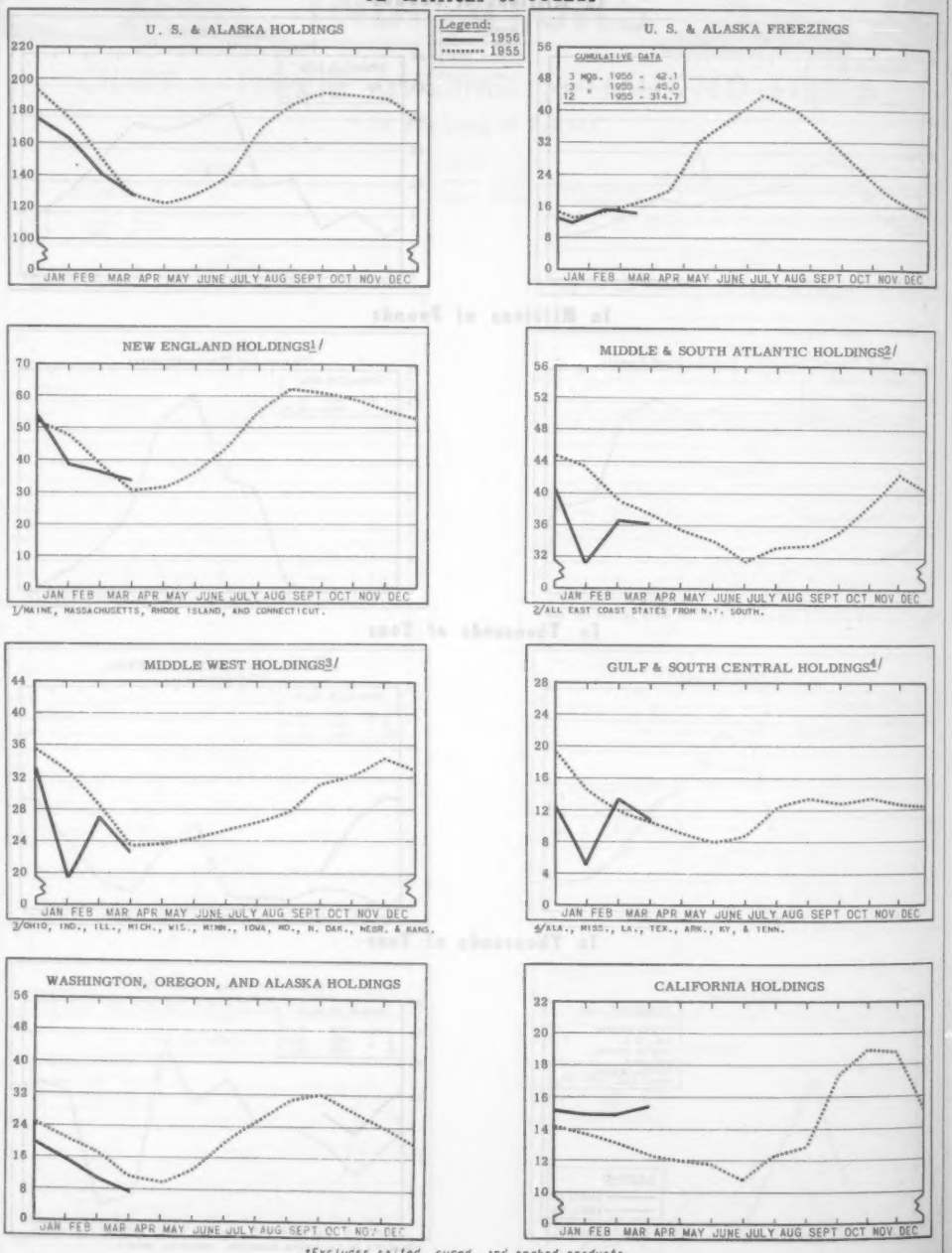



TUNA AND TUNA-LIKE FISH 2/
CUMULATIVE DATA
3 MOS. 1956 - 51.5
3 " 1955 - 33.5
12 " 1955 - 183.7
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

2/RECEIPTS BY CALIFORNIA CANNERIES, INCLUDING IMPORTS.

CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds


U. S. & ALASKA HOLDINGS
Legend:
1956
1955
U. S. & ALASKA FREEZINGS
CUMULATIVE DATA
3 MOS. 1956 - 42.1
3 " 1955 - 45.0
12 " 1955 - 314.7
NEW ENGLAND HOLDINGS1/
MIDDLE & SOUTH ATLANTIC HOLDINGS2/
MIDDLE WEST HOLDINGS3/
GULF & SOUTH CENTRAL HOLDINGS4/
WASHINGTON, OREGON, AND ALASKA HOLDINGS
CALIFORNIA HOLDINGS
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

1/MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT.

2/ALL EAST COAST STATES FROM N.Y. SOUTH.

3/OHIO, IND., ILL., MICH., WIS., MINN., IOWA, MO., N. DAK., NEBR. & KANS.

4/ALA., MISS., LA., TEX., ARK., KY, & TENN.

*Excludes salted, cured, and smoked products.

CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

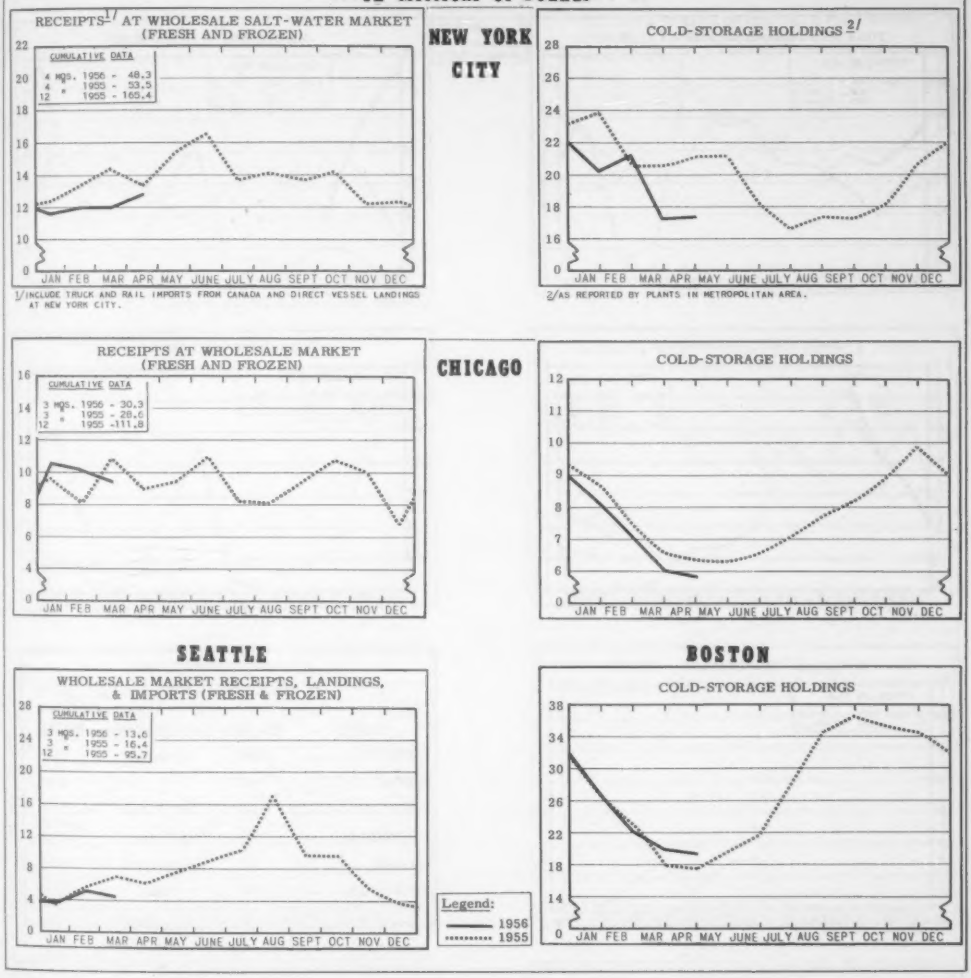

RECEIPTS 1/ AT WHOLESALE SALT-WATER MARKET (FRESH AND FROZEN)
CUMULATIVE DATA
4 MOS. 1956 - 48.3
4 " 1955 - 53.5
12 " 1955 - 165.4
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.
NEW YORK CITY
COLD-STORAGE HOLDINGS 2/
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.
RECEIPTS AT WHOLESALE MARKET (FRESH AND FROZEN)
CUMULATIVE DATA
3 MOS. 1956 - 30.3
3 " 1955 - 28.6
12 " 1955 -111.8
CHICAGO
COLD-STORAGE HOLDINGS
SEATTLE
WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (FRESH & FROZEN)
CUMULATIVE DATA
3 MOS. 1956 - 13.6
3 " 1955 - 16.4
12 " 1955 - 95.7
BOSTON
COLD-STORAGE HOLDINGS
Legend:
1956
1955

CHART 5 - FISH MEAL and OIL PRODUCTION - U.S and ALASKA

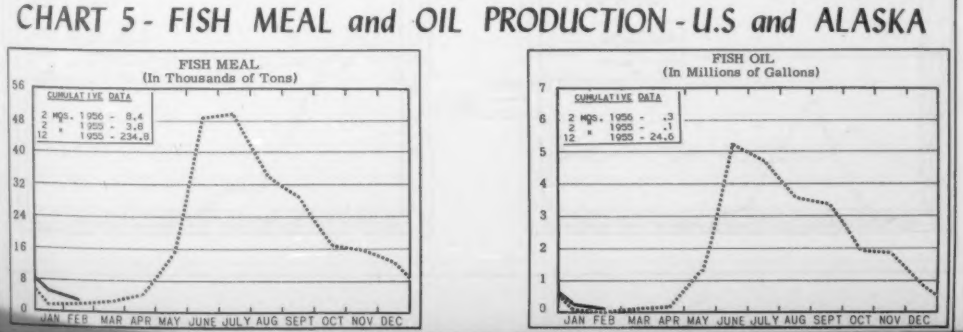
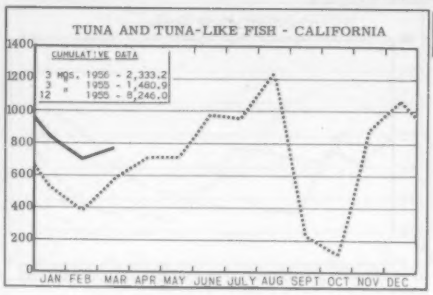
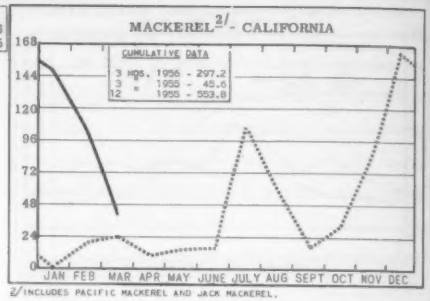

FISH MEAL
(In Thousands of Tons)
CUMULATIVE DATA
2 MOS. 1956 - 8.4
2 " 1955 - 3.8
12 " 1955 - 234.8
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
FISH OIL
(In Millions of Gallons)
CUMULATIVE DATA
2 MOS. 1956 - .3
2 " 1955 - .1
12 " 1955 - 24.6
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

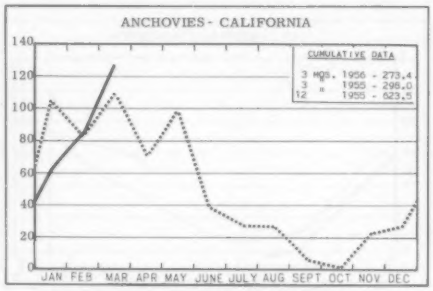
In Thousands of Standard Cases

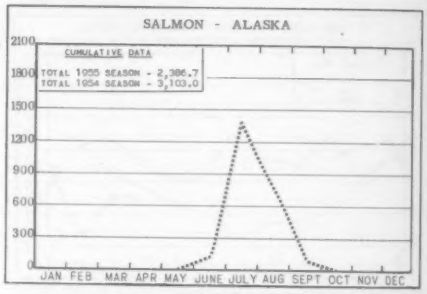


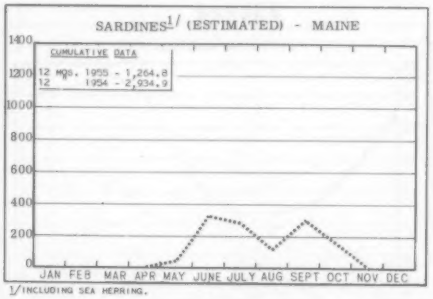
Legend:
1956
1955



2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



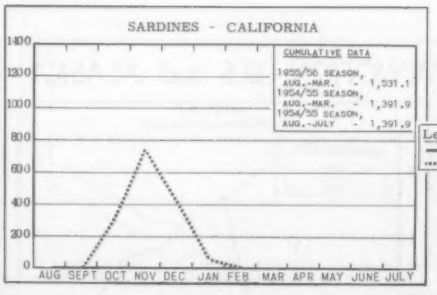




1/ INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	¼ drawn	3¾ oz.
SHRIMP.....	48	--	5 oz.
TUNA	48	No. ½ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	½ lb.	8 oz.



Legend:
1956/57
1955/56

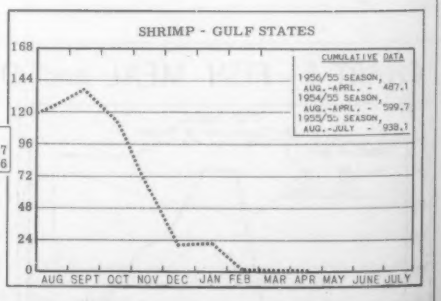
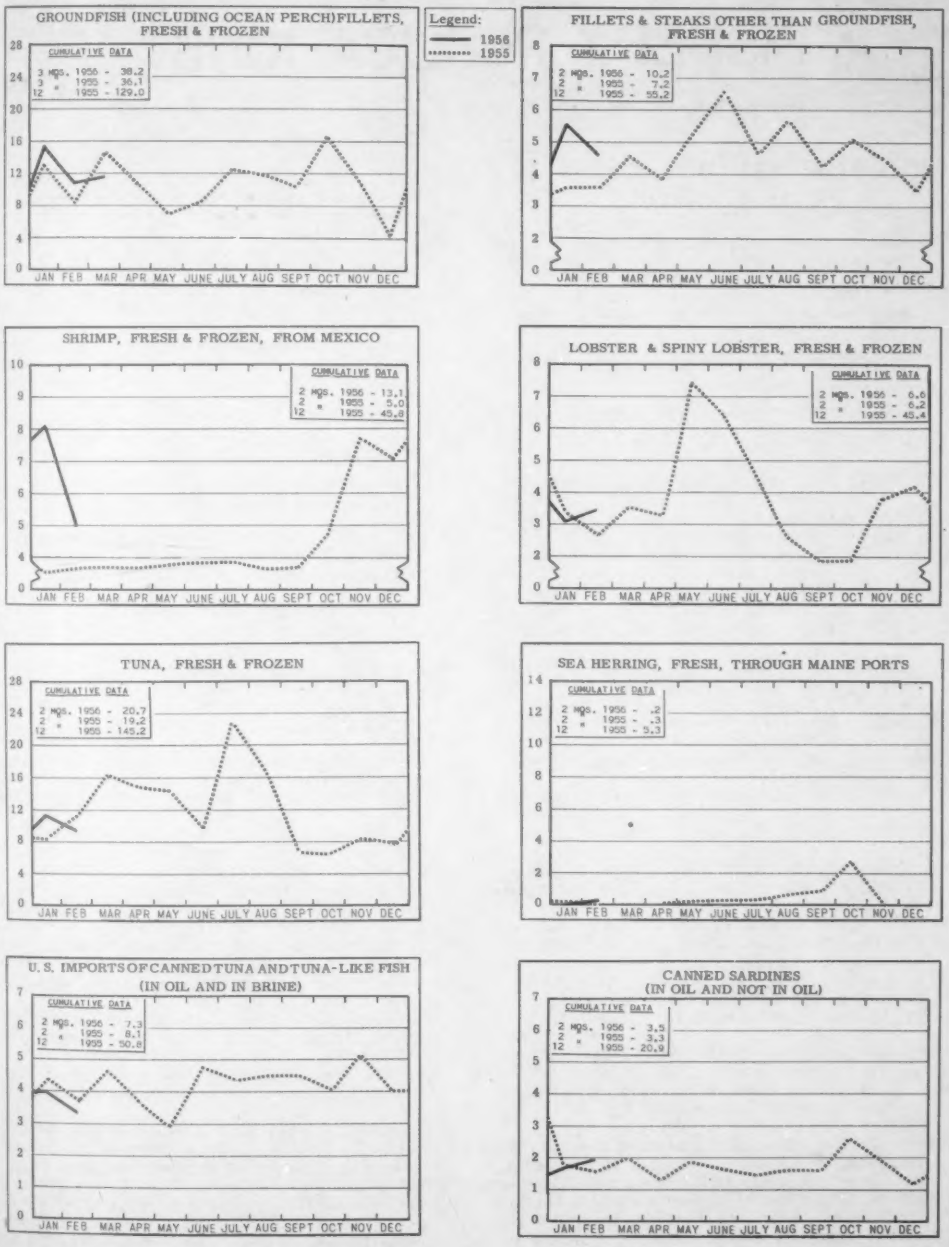
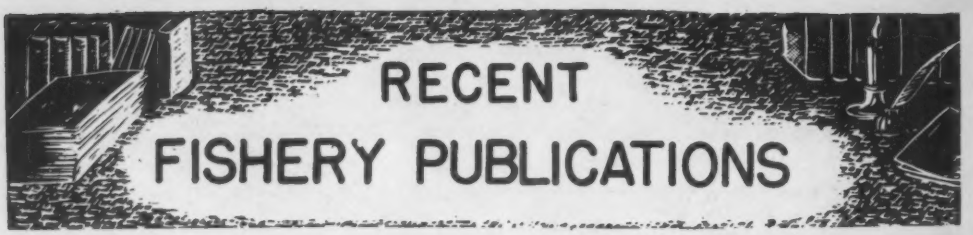


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds


GROUNDFISH (INCLUDING OCEAN PERCH) FILLETS, FRESH & FROZEN
CUMULATIVE DATA
3 MOS. 1956 - 38.2
3 " 1955 - 36.1
12 " 1955 - 129.0
Legend:
1956
1955
FILLETS & STEAKS OTHER THAN GROUNDFISH, FRESH & FROZEN
CUMULATIVE DATA
2 MOS. 1956 - 10.2
2 " 1955 - 7.2
12 " 1955 - 55.2
SHRIMP, FRESH & FROZEN, FROM MEXICO
CUMULATIVE DATA
2 MOS. 1956 - 13.1
2 " 1955 - 5.0
12 " 1955 - 45.8
LOBSTER & SPINY LOBSTER, FRESH & FROZEN
CUMULATIVE DATA
2 MOS. 1956 - 6.6
2 " 1955 - 6.2
12 " 1955 - 45.4
TUNA, FRESH & FROZEN
CUMULATIVE DATA
2 MOS. 1956 - 20.7
2 " 1955 - 19.2
12 " 1955 - 145.2
SEA HERRING, FRESH, THROUGH MAINE PORTS
CUMULATIVE DATA
2 MOS. 1956 - .2
2 " 1955 - .3
12 " 1955 - 5.3
U. S. IMPORTS OF CANNED TUNA AND TUNA-LIKE FISH (IN OIL AND IN BRINE)
CUMULATIVE DATA
2 MOS. 1956 - 7.3
2 " 1955 - 8.1
12 " 1955 - 50.8
CANNED SARDINES (IN OIL AND NOT IN OIL)
CUMULATIVE DATA
2 MOS. 1956 - 3.5
2 " 1955 - 3.3
12 " 1955 - 20.9
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
FL - FISHERY LEAFLETS.
SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR. - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-1282 - Massachusetts Landings, December 1955, 5 pp.

CFS-1286 - Canned Fish & Byproducts, 1955 Annual Summary, 22 pp.

CFS-1287 - Packaged Fish, 1955 Annual Summary, 3 pp.

CFS-1290 - Rhode Island Landings, January 1956, 3 pp.

CFS-1292 - Fish Meal and Oil, February 1956, 2 pp.

CFS-1295 - Georgia Landings, January 1956, 2 pp.

CFS-1296 - California Landings, November 1955, 4 pp.

CFS-1297 - New Jersey Landings, 1955 Annual Summary, 4 pp.

CFS-1300 - Alabama Landings, January 1956, 2 pp.

CFS-1305 - Georgia Landings, February 1956, 2 pp.

CFS-1311 - Shrimp Landings, February 1956, 4 pp.

FL - 434 - Facts About Red Tide, 2 pp., illus., processed, March 1956. Red Tide is the popular name for the colored-water and mass fish kills that have occurred off the Gulf coasts of Florida, Texas, and Mexico, as a result of overgrowth of a microscopic marine organism known as Gymnodinium brevis. This leaflet describes Red Tide and answers questions regarding this phenomenon.

Wholesale Dealers in Fishery Products (Revised):

SL - 4 - Rhode Island, 1956, 2 pp.

SL - 36 - Iowa, 1955 (Mississippi River and Tributaries Area), 2 pp.

SSR-Fish. No. 165 - Food Habits of Georges Bank Haddock, by Roland L. Wigley, 29 pp., illus., processed, January 1956. This report presents the results of the first year's study of haddock food habits. The author states, that "The haddock's diet consisted principally of sedentary or slow moving invertebrate animals; benthic and epi-benthic forms predominated. Small organisms were especially common in the food, presumably because the haddock's rather small mouth precludes taking large items. The percentage volume of each major food group in the diet was as follows: Crustacea - 33.1 percent; Mollusca - 17.5 percent; Echinodermata - 14.6 percent; Annelida - 9.9 percent; and Pisces - 1.9 percent. Canadian biologists have reported that haddock on the offshore Nova Scotian banks fed predominately on fish. On Georges Bank crustaceans were found to be the primary food; fish constituted less than 2 percent of the food volume. Other notable differences were disclosed in the dietary composition of specimens collected from various parts of Georges Bank itself."

Sep. No. 436 - Insurance of Fishing Vessels: Some Current Problems.

Sep. No. 437 - Research in Service Laboratories (May 1956): Contains these short articles--"Jacketed-Principle Cold-Storage Room;" "Use of Fish Oils for Ore Flotation;" "Frozen Breaded Shrimp Federal Specification;" "Cod-Liver Oil Concentrate Has Unique Use."

Annual Report of the Director Fish and Wildlife Service to the Secretary of the Interior, Fiscal Year Ended June 30, 1955 (Reprinted from the Annual Report of the Secretary of the Interior), 33 pp., printed. Summarizes the various activities of the Service. Specifically discussed are: utilization of the commercial fishery resources (describes the activities of the Branch of Commercial Fisheries); management of the Alaska commercial fisheries; Pribilof Islands fur-seal industry; maintenance of inland waters; research in fishery biology (coastal, inland, marine, and shellfish fisheries); Federal aid to states for the restoration of fish and wildlife; river basin development and wildlife needs; international cooperation in conservation (international technical cooperation and international conservation agreements); and other activities.

One of the problems which came in for attention during the period of the report and which will have more attention in the future covered efforts to control the sea lampreys which are ruining commercial fishing in the Great Lakes.

Biological research covered a wide field of activities in many parts of the world. Recently-developed methods of predicting shad runs in the Hudson and Connecticut Rivers proved successful; limited studies by the Service and coordination of striped bass research conducted by the States under the Federal aid program

continued; encouraging results were obtained from experimental fertilization of Bare Lake on Kodiak Island to increase red salmon production; electrical devices to guide salmon over dams were further developed; numerous shellfish problems were given attention; a fleet of five vessels covered thousands of square miles of Pacific waters in a study of distribution, abundance and identity of salmon stocks; bacterial diseases of fishes, problems relative to Atlantic herring, yellowtail flounder, whiting, sea scallops and gulf shrimp and a number of other matters relative to the culture and habit of fish came in for field and laboratory scrutiny.

Exploratory fishing operations were continued in the Atlantic and Pacific Oceans and in the Gulf of Mexico. Discoveries of long-range importance to the tuna fishery were made in the central Pacific and in the Gulf of Mexico. New fishing areas for ocean perch, shrimp, and albacore were found.

Funds available from the Saltonstall-Kennedy Act permitted added emphasis to fishery research and the development of new marketing outlets for fishery products.

Special marketing campaigns were conducted to move surplus stocks of small haddock fillets and canned tuna. There was considerable interest on the part of the fishing industry in voluntary Federal standards for grade and conditions of fishery products. Certain standards had been developed during the previous year and others are being developed.

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Seattle) Monthly Summary - Fishery Products, March 1956, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 421 Bell St. Terminal, Seattle 1, Wash.) Includes landings and local receipts as reported by Seattle and Astoria (Oregon) wholesale dealers.

(Chicago) February 1956 Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Prices, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; for the month indicated.

(New York) Monthly Summary - January 1956 - Receipts of Fishery Products at the New York City Wholesale Salt-Water Fish Market, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.) Receipts in the salt-water section of the Fulton Fish Market by species and by states and provinces for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, March 1956, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.)

Receipts of Fresh and Frozen Fishery Products at Chicago - 1954, by G. A. Albano, 35 pp., processed, February 1956. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 565 West Washington St., Chicago 6, Ill.) This report presents an analysis of the marketing trends for fresh and frozen fishery products and statistical tables on the receipts of fresh and frozen fish and shellfish at Chicago during 1954. Statistics on arrivals of fishery products at Chicago are presented by species and by states and provinces of origin; states and provinces by species; species by months; states and provinces by months; totals by species; and totals by states and provinces. Receipts are tabulated by methods of transportation (truck, express, and freight). A table shows the monthly range of wholesale prices of some of the leading varieties of fresh and frozen fishery products handled on the Chicago market. In the analysis of the marketing trends for fresh and frozen fishery products at Chicago, the author discusses the sources of the receipts, methods of transportation, months of greatest receipts, receipts by species and varieties, lake trout and whitefish receipts, U. S. Great Lakes fishery production, U. S. imports of fresh and frozen fish from Canada, U. S. imports of frozen fillets, and cold-storage inventories. Also included is a table giving the names, classifications, and approximate weights of certain fishery products sold in the Chicago wholesale market.

Receipts of Fishery Products at New York City, 1954, by Henry M. Bearse, 19 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 155 John Street, New York 38, N. Y.) Contains an analysis of fishery products receipts for 1954 and marketing trends at New York City. The author discusses in the first part of this report the salt-water market receipts; marketing trends; receipts by shipping areas; receipts by species; trends in method of transportation; fresh-water market receipts; and imports of fishery products through the New York customs district. The tables, in the second part of this report, present data on receipts of fish and shellfish in the salt-water section of Fulton Market by months and method of transportation, by species and method of transportation, and by states and provinces of origin.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

"Asdic in the Fishing Industry," by C. M. Good, article, World Fishing, vol. 5, no. 3, March 1956, pp. 26-28, illus., printed. John Trundell Ltd., Temple Chambers, Temple Ave., London, E.C. 4, England. The use of horizontal echo-searching equipment on a commercial basis is still very much in its infancy, and much experimental work remains to be done before there can be any general application. This article discusses some of the problems of adopting Asdic equipment to commercial fishing, gives details of the most desirable beam shape

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATIONS ISSUING THEM.

required for fish finding, and deals with the snags met with through the effects of rolling.

"The Atlantic Salmon's Comeback," by Anthony Netboy, article, Nature Magazine, vol. 49, no. 1, January 1956, pp. 37-40, illus., printed, single copy 50 cents. American Nature Association, 1214 - 16th St., N.W., Washington 6, D. C. Includes a brief history of the Atlantic salmon, Salmo salar, a description of their habits, and a discussion of the salmon restoration programs being conducted in the United States and Canada.

(California) The Marine Fish Catch of California for the Years 1953 and 1954 (with Jack Mackerel and Sardine Yield Per Area from California Waters 1946-47 Through 1954-55), Fish Bulletin No. 102, 99 pp., illus., printed. Marine Fisheries Branch, Department of Fish and Game, Sacramento 14, Calif., 1956. This bulletin includes records of the pounds of fish landed in the different areas of the State of California and their value to the fishermen. It is prepared to meet the numerous requests for such data received throughout the year from members of the fishing industry, harbor commissions, scientists, and persons in other related fields for use in their studies and reports. Although this bulletin carries the title "Marine Fish Catch," small poundages of fresh-water commercial landings are also included.

The Charles F. Johnson Billfish Investigation, Summary of Investigations for the Period Comprising January 1954 through August 1955, by Luis Rene Rivas, Progress Report No. 1, 8 pp., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla., September 1955.

Convention for the Regulation of the Meshes of Fishing Nets and the Size Limits of Fish--London, April 5, 1946 (Presented by the Secretary of State for Foreign Affairs to Parliament by Command of Her Majesty, March 1956), Cmd. 9704, Treaty Series No. 8 (1956), 16 pp., printed in French and English, 9d.(10 U. S. cents). Her Majesty's Stationery Office, London, England.

"The Conversion of Herring Stickwater to Solubles. III. Preservative Action of Penicillin G on Salmon Offal Stickwater under Plant Conditions," by W.A.B. Thomson, R. E. E. Jonas, R. A. MacLeod, and D. R. Idler, article, Progress Reports of the Pacific Coast Stations, no. 105, February 1956, pp. 27-30, illus., printed. Fisheries Research Board of Canada, Technological Station, 898 Richards St., Vancouver 2, B.C., Canada.

(Department of Scientific and Industrial Research) Report for the Year 1954-55 (Presented by the Lord President of the Council to Parliament by Command of Her Majesty, March 1956), Cmd. 9690, 321 pp., printed, 7s. 6d. (US$1.05), Her Majesty's Stationery Office, London, England. Contains reports, among others, on developments and research work on fish and fishery products, and water pollution research.

"Down to the Sea--for Fish," by Irwin M. Alperin, article, The New York State Conservationist, vol. 10, no. 4, February-March 1956, pp. 22-27, illus., printed. New York State Conservation Dept., Arcade Bldg., Albany, N. Y. A survey of New York's marine sport fishery tells where the bulk of the fishing took place, how it varied seasonally, and what facilities were available for the sportsmen. It was found that more than 30 species of finfish are taken by anglers along the 600-mile coastline of New York's Marine District. However, only about a half dozen of these make up the real volume of the catch. The most important species include porgy, fluke or summer flounder, sea bass, bluefish, flounder, and blackfish. Other species are taken in numbers and occassionally contribute a considerable part of the catch in selected areas. More than 415,000 boat trips were taken from April through October 1954 to catch some species of fish somewhere in the Marine District. Another 71,000 fishing-days were spent by bank, beach, pier, and jetty fishermen during this same period. In all, about 1,700,000 angler-days were spent in pursuit of marine species by the sport fishermen. It was estimated that the catch of open and charter boats during the 1954 season was over 5,300,000 fish of all species.

East African Fisheries Research Organization Annual Report, 1954/1955, 46 pp., printed. East African Fisheries Research Organization, Jinja, Uganda, 1955.

"Ecological Observations on a Locally Limited Red Tide Bloom," by Ilmo Hela, article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 5, no. 4, 1955, pp. 269-291, illus., printed. Marine Laboratory, University of Miami, Coral Gables (University Branch) 46, Fla.

"Effect of Chlortetracycline and Storage Temperatures on the Quality of Shucked Oysters," by J. W. Boyd and H. L. A. Tarr, article, Progress Reports of the Pacific Coast Stations, no. 105, February 1956, pp. 12-13, printed. Fisheries Research Board of Canada, Technological Station, 898 Richards St., Vancouver 2, B.C. Canada.

"Farm Fish Pond Troubles," by Olan Dillon, article, Louisiana Conservationist, vol. 8, no. 6, March 1956, pp. 8-9, illus., printed. Louisiana Wild Life and Fisheries Commission, 126 Civil Courts Bldg., New Orleans, La.

The Fecundity of TILAPIA Species, by Rosemary H. Lowe (McConnell), 8 pp., illus., printed. (Reprinted from East African Agricultural Journal, vol. XXI, no. 1, July 1955, pp. 45-52) East African Fisheries Research Organization, Jinja, Uganda.

Federal Aid in Fish and Wildlife Restoration (Annual Reports of the Dingell-Johnson and Pittman-Robertson Programs for the Fiscal Year Ending June 30, 1955), 102 pp., illus., printed. Wildlife Management Institute, Wire Bldg., Wash-

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ington 5, D. C., and Sport Fishing Institute, Bond Bldg., Washington 5, D.C. Included, among others, are reports on accomplishments of the fish restoration program; a list of Federal aid in fish restoration projects approved during the 1955 fiscal year and the funds obligated; apportionment of funds to the states and territories for use in fish restoration projects for the fiscal year 1955, pursuant to the Dingell-Johnson Act; and a summary of Federal aid in fish restoration apportionments, obligations, reversions, and balances for the fiscal year 1955. The distinct trend in the Dingell-Johnson program toward more developmental work designed to expand the Nation's basic sport fishery resource is noteworthy. In the early years of the fish restoration program, greatest emphasis was placed on fact-finding activities. This year, for the first time, the amount of funds obligated by the states for physical improvements exceeded that scheduled for research. Because of the over-all increase in the funds available, the increase in on-the-ground or in-the-water restoration measures has been made without jeopardizing the continued growth of the investigational program.

Feeding Mechanism of the Cichlid Fish, TILAPIA ESCULENTA Graham, by P. H. Greenwood, 3 pp., illus., printed. (Reprinted from Nature, vol. 172, p. 207, August 1, 1953) East African Fisheries Research Organization, Jinja, Uganda.

Fishery Research in East Africa, by R. S. A. Beauchamp, 8 pp., printed. (Reprinted from The Uganda Journal, vol. 19, no. 2, September 1955, pp. 169-176) East African Fisheries Research Organization, Jinja, Uganda.

Fishery Research in the Lakes of East Africa, by R. S. A. Beauchamp, 5 pp., printed. (Reprinted from East African Agricultural Journal, vol. XIX, no. 4, April 1954, pp. 203-207) East African Fisheries Research Organization, Jinja, Uganda.

Fishery Research Trawler (First British Trawler with Diesel-Electrical Propulsion), 3 pp., illus., printed. (Reprinted from The Shipping World, pp. 67-69, July 20, 1955; also reprinted from Engineering, pp. 220-221, August 12, 1955) Department of Scientific and Industrial Research, Aberdeen, Scotland. Describes the research trawler, Sir William Hardy, which is specially equipped for investigations into the preservation of fish as food. In addition to the normal facilities for trawling, the equipment provided includes laboratories, an experimental freezing plant, an insulated hold for iced fish, and a liver-oil plant.

The Fishes of Uganda--I, by P. H. Greenwood, 19 pp., illus., printed. (Reprinted from The Uganda Journal, vol. 19, no. 2, Sept. 1955, pp. 137-155) East African Fisheries Research Organization, Jinja, Uganda.

(FAO) The Sea and World Food Supplies, by D. B. Finn, FAO Fisheries Papers No. 8, 23 pp., processed. (Reprinted from Nutrition Abstracts and Reviews, vol. 24, pp. 487-496, 1954.) Food and Agriculture Organization of the United Nations, Rome, Italy, February 1956. Discusses the state of world food supplies, supplies of food from fisheries, per-capita consumption of fishery products, and the prospect for increase in aquatic food.

The Food of TILAPIA in East Africa, by G. R. Fish, 7 pp., illus., printed. (Reprinted from The Uganda Journal, vol. 19, no. 1, March 1955, pp. 85-89) East African Fisheries Research Organization, Jinja, Uganda.

"Golden Harvest of the Sea," by Frank A. Montgomery, Jr., article, The Crown, vol. 45, no. 4, April 1956, pp. 14-15, 22-23, illus., printed. Crown Cork & Seal Co., Inc., P. O. Box 1837, Baltimore 3, Md. A good description of the shrimp fishery along the South Atlantic and Gulf coasts, including method of capture, preparation for market, and various types of research being conducted to improve the fishery. A brief description of the life history of the shrimp is also presented.

Handbook of Tropical Aquarium Fishes, by Herbert R. Axelrod and Leonard P. Schultz, 719 pp., illus., printed, $10. McGraw-Hill Publishing Co., New York, N. Y., 1955.

How to Produce Best Quality Whitefish, 10 pp., illus., processed. Department of Fisheries, Ottawa, Canada, March 1955. This leaflet illustrates photographically good and bad handling and packing practices.

(ICA) Operations Report, February 24, 1956, FY 1956, Issue No. 1, 57 pp., illus., processed. Office of Statistics and Reports, International Cooperation Adm., Washington 25, D. C.

Journal of the Faculty of Fisheries and Animal Husbandry, Hiroshima University, vol. 1, no. 1, 204 pp., illus., printed. Faculty of Fisheries and Animal Husbandry, Hiroshima University, Fukuyama, Japan, August 1955. This publication is the first number of the Journal of the Faculty of Fisheries and Animal Husbandry, Hiroshima University, published by the Faculty. The Journal should be issued annually, and is devoted to the study of the sciences of fisheries and animal husbandry.

"Lake Ontario Lake Trout," by Donald G. Pasko, article, The New York State Conservationist, vol. 10, no. 4, February-March 1956, pp. 16-17, illus., printed. New York State Conservation Dept., Arcade Bldg., Albany, N. Y. The decline of the Lake Ontario lake trout was from the start a problem of an international nature. Annual conferences on Lake Ontario fisheries problems had been held between representatives of New York and Ontario for some years, and in 1953 an international lake trout program was begun. Experimental plantings of young lake trout obtained from fish hatcheries were begun in the fall of 1953, and considering the small numbers of trout planted in relation to

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the great size of the lake and the great odds against any of them being accidentally entangled in nets, the number of recoveries is very encouraging and indicates good survival. The growth rate of the trout has also been very good. According to the author, it will take considerably more time and study to get all the information desired on the results of the experimental plantings. However, the friendly spirit of cooperation between the conservation agencies of New York and Ontario and the results achieved to date are hopeful signs that progress is being made towards returning the lake trout to the important position it once held in Lake Ontario.

Life in Fresh Water, by E. S. Brown, 64 pp., illus., printed, $2.75. Oxford University Press, 114 5th Avenue, New York 11, N. Y. More numerous than the familiar fish, frogs, and tadpoles are the more lowly creatures, such insects as the water-boatman and water beetles, water fleas and tiny mollusks.

The Manufacturing Potential of the North Carolina Commercial Fisheries, by William A. Ellison, 54 pp., processed. N. C. Department of Conservation and Development, Raleigh, N. C., February 15, 1956. A report on the possibilities of developing the processing, packaging, and marketing of fish and shellfish produced in North Carolina. Primary attention in this study was given to source, distribution and amount of raw material; existing methods of manufacture; suitability of fish houses for expansion; equipment in fish houses; retail trade practices governing both packaged fish and shellfish and round fresh fish; methods of processing in other states; suitability of native raw material for manufacture; abundance and potential abundance of raw material; manufacturing and equipment costs. The author states, that "(1) the North Carolina commercial fisheries offer excellent inherent possibilities for processing, although the possible magnitude of such is relatively small when compared with Maryland, Virginia, some of the Gulf States, and New England. Manufacture, however, even on a somewhat limited scale would substantially raise the income in several of the seaboard counties and would have a most pronounced effect on a few; (2) Expansion of processing will depend largely on the so-called deluxe animals to be found among the crustacea and mollusks. Finfish offer some, but only limited and occasional possibilities; and extensive manufacture of fish would have to be done in conjunction with other commodities which would carry plant burden and afford a steady labor supply; (3) Processing of shrimp in frozen breaded, peeled and shelled, and split-shell consumer packages offer an immediate and promising opportunity; (4) The expansion of crab meat manufacture is favored by natural abundance and quality, but any extension of this industrial unit will heavily rest on the development of a greater market by the producer; (5) Inherently the oyster offers an excellent opportunity. Until the supply is stabilized at a level higher than it is today, there appears no possibility that this unit of the fisheries will flourish beyond its present somewhat sickly stage; (6) The quality of North Carolina seafood is excellent, unsurpassed by that of any state; and its freshness, particularly in regard to shrimp, offers any processor a merchandizing lever of great strength; and (7) The ultimate position of North Carolina in the seafood industry of the nation will largely depend upon the development of a merchandising system on the part of the industry."

The Marine Laboratory Prospectus, no. 55-32, 37 pp., illus., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla., December 1955.

"Marine Mammals," by E. Laurence Palmer, article, Nature Magazine, vol. 49, no. 1, January 1956, pp. 25-32, illus., printed, single copy 50 cents. American Nature Association, 1214 - 16th St., N. W., Washington 6, D. C. Presents a list of the marine mammals, with the common name, scientific name, description, range and relationship, reproduction, ecology, and economic aspects of these animals of the sea.

"Marine Science in the Pacific Area," by G. E. R. Deacon, article, Nature, vol. 177, no. 4504, February 25, 1956, pp. 353-355, printed. MacMillan & Co., Ltd., St. Martin's St., London, W.C.2, England (also St. Martin's Press, Inc., 103 Park Ave., New York 17, N. Y.) Because of the growing needs of marine research the United Nations Educational, Scientific and Cultural Organization nominated an Interim Advisory Committee. The Committee held its first meeting in Tokyo during October 1955 and started with a general discussion of trends and progress in marine research. The author outlines some of the main features of this meeting and discusses in particular marine science in Japan. He states, that "The fisheries research (in Japan) is aimed primarily at finding and improving the exploitation of fishing grounds and attempting to foresee fluctuations in distribution and numbers of mackerel, sardine, squid, herring, salmon, skipjack, tunas, and whales. The work includes extensive ecological surveys of spawning and nursery grounds, and detailed studies to improve the understanding of variations in the principal currents, particularly the Kuroshio and Oyashio. It includes research cruises to the Bering Sea and more than half-way across the Pacific Ocean. As in other countries, there is no obvious or logical division between the basic and applied research; but there seems to be a tendency for the initiative in the basic work to be with the universities, though they do not lack active collaboration from the government and regional laboratories devoted to hydrographic, meteorological and fisheries research."

The Master Diver and Underwater Sportsman, by T. A. Hampton, 208 pp., illus., printed, $5. John de Graff, Inc., 64 W. 23rd St., New York 10, N. Y. A diving manual giving instruction in diving, protective clothing, underwater cutting and welding, blasting and seamanship.

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Movements of Salmon and Sea Trout, Chiefly Kelts, and of Brown Trout Tagged in the Tweed between January and May 1937 and 1938, by G. Herbert Nall, Freshwater and Salmon Fisheries Research Series no. 10, 19 pp., printed. H. M. Stationery Office, Edinburgh, Scotland, 1955.

Navigation Dictionary, H. O. Pub. No. 220, 256 pp., printed, $2. U. S. Navy Hydrographic Office, Washington, D. C., 1956. (For sale by authorized Sales Agents of the U. S. Navy Hydrographic Office; also by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.) The need for a comprehensive, authoritative dictionary of navigational terms has been widely recognized. The purpose of this volume is to supply that need by furnishing the navigator of any type craft with definitions that represent present usage.

Operation of the Trade Agreements Program, Eighth Report, July 1954-June 1955, 321 pp., processed. United States Tariff Commission, Washington 25, D. C., 1956.

This report discusses changes made in United States trade agreements legislation by the Trade Agreements Extension Act of 1955. It covers important developments, in the last half of 1954 and the first half of 1955, respecting the General Agreement on Tariffs and Trade, including the review of the General Agreement conducted by the contracting parties at their Ninth Session; and it discusses the proposed Organization for Trade Cooperation. It analyzes the United States trade-agreement negotiations that were conducted with Japan and other countries during this period. Like the earlier reports in the series, the eighth report also discusses such matters as the actions of the United States relating to its trade agreements program; changes in tariffs, exchange controls, and quantitative restrictions on imports by contracting parties to the General Agreement; and changes in tariffs, exchange controls, and quantitative restrictions on imports by countries with which the United States has bilateral trade agreements.

Peces de Importancia Comercial en la Costa Nor-Occidental de Mexico (Fishes of Commercial Importance on the Northwest Coast of Mexico), by Julio Berdegue A., 350 pp., illus., printed, in Mexican. Secretaria de Marina, Direccion General de Pesca, Comision para el Fomento de la Piscicultura Rural, Mexico D. F., 1956.

La Pesca en el Lago de Patzcuaro, Michoacan, y su Importancia Economica Regional (The Fish in Lake Patzcuaro, Michoacan, and Their Regional Economic Importance), by Aurelio Solorzano Preciado, 59 pp., illus., printed, in Mexican. Secretaria de Marina, Direccion General de Pesca, Comision para el Fomento de la Piscicultura Rural, Mexico D.F., 1955.

(Rapports et Proces-Verbaux des Reunions) Report on Echo-Sounding and Asdic for Fishing Purposes, vol. CXXXIX, edited by W. C. Hodgson and A. Fridriksson, 51 pp., illus., printed, Kr. 12 (US$1.74). Conseil Permanent International Pour L'Exploration de la Mer (International Council for Exploration of the Sea), Charlottenlund Slot, Denmark, September 1955. Presents the results of a survey begun in 1950 to collect as much information as possible concerning the problems of echo-sounding as an aid to commercial fishing. This survey showed that asdics are only used in whaling and have as yet no place in other commercial fisheries although horizontal echo-sounding has recently been introduced to the Norwegian herring industry. This report contains a history of echo-sounding development; principles of echo-sounding; identification of echo-traces; applications of echo-soundings; state of echo-sounding in various countries; and suggestions to manufacturers. Appendixes include two articles: "A Proposal for the Introduction of Organized Echo-Search in North Sea Herring Investigations," by B. B. Parrish; and "The Use of Echo-Sounder in Fish-Location--A Survey of Present Knowledge, with Notes on the Use of Asdic," by R. E. Craig.

"Red Tide and the Fluctuation of Conservative Concentrations at an Estuary Mouth," by Frank Chew, article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 5, no. 4, 1955, pp. 321-330, illus., printed. Marine Laboratory, University of Miami, Coral Gables (University Branch) 46, Fla.

Salmon and Steelhead Fishing Map, 2 pp., folder, illus., printed. Department of Fish and Game, 926 Jay St., Sacramento 14, Calif. A description of the California salmon and steelhead fishery and what is necessary to maintain it. Includes description of the species of salmon and trout found in California waters, brief comments on the main California river systems, and conservation problems.

Seventh Annual Report of the Supervisory Committee for Brown Trout Research, 1954-1955, Scottish Home Department Freshwater and Salmon Fisheries Research 12, 15 pp., printed, 2s. 6d. (35 U. S. cents). Her Majesty's Stationery Office, Edinburgh, Scotland, 1956. This report covers the period November 1954 to October 1955. The section on research covers fish investigations, bottom fauna studies, botanical work, and chemical work.

"The Sodium and Potassium Content of British Columbia Sea Foods. II. Some Commercially Important Fresh Fish," by J. McBride and R. A. MacLeod, article, Progress Reports of the Pacific Coast Stations, no. 105, February 1956, pp. 19-21, printed. Fisheries Research Board of Canada, Technological Station, 898 Richards St., Vancouver 2, B. C., Canada.

"Some Red Tide Characteristics during 1952-54," by Howard T. Odum, J. B. Lackey, Jacqueline Hynes, and Nelson Marshall, article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 5, no. 4, 1955, pp. 247-258, printed. Marine Laboratory, University of Miami, Coral Gables (University Branch) 46, Fla.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATIONS ISSUING THEM.

Species of TILAPIA in East African Dams, with a Key for Their Identification, by Rosemary H. Lowe (McConnell), 7 pp., illus., printed. (Reprinted from East African Agricultural Journal, vol. XX, no. 4, April 1955, pp. 256-262) East African Fisheries Research Organization, Jinja, Uganda.

Svenskt Fiskeleksikon, editor in chief Dr. Nils Rosen, 704 pp., illus., in color and black and white, printed in Swedish. AB Nordiska Upslagsböcker, Stockholm, Sweden, 1955. A beautifully illustrated encyclopedia of Sweden's fisheries in one volume. Both the commercial fisheries and the sport fisheries are covered in considerable detail. Practically every page has an illustration or two in the form of a line cut, photograph, map, or graph. In addition, there are 24 full-page color plates of 62 species of fish and shellfish and of sports-fishing gear. Other full-page illustrations depict vessel types, fishing gear, and fishing methods. About 70 of Sweden's experts in every phase of its fisheries contributed articles to the encyclopedia on literally thousands of fishery subjects. An examination of the volume leads to only two regrets--first, that it is not available in English, and second, that there is no similar work covering the fisheries of the United States.

--A. W. Anderson

Technical Report of Fishing Boat, No. 7, 92 pp., illus., printed in Japanese, with brief English abstracts. Fishing Boat Laboratory, Production Division, Fisheries Agency, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyodaku, Tokyo, Japan, January 1956. Contains, among others, the following report: "Structural Strength Investigations on Alumimum Fishing Boat," by Shozo Wada.

The Tohoku Journal of Agricultural Research, vol. VI, no. 1, 91 pp., illus., printed, September 1955. Faculty of Agriculture, Tohoku University, Sendai, Japan. Contains, among others, the following articles: "Studies on the Blue Green Pigments of the Integuments of Fishes. (1) The Isolation of Ichthyoverdin from the Scales of Sauries, Cololabis saira Brevoort," by Yasuhiko Tsuchiya and Tadasi Nomura; and "Biochemical Studies of the Ascidian, Cynthia roretzi v. Drasche. I. On the Nitrogenous Extracts," by Yoshio Suzuki.

The Torry Research Station and the Humber Laboratory, 17 pp., illus., printed. The Food Investigation Organization, Department of Scientific and Industrial Research, 20A Regent St., Cambridge, England. The Torry Research Station at Aberdeen and the Humber Laboratory at Hull deal with the preservation of fish and its byproducts. This pamphlet gives a brief explanation of their work.

The True Book of Animals of the Sea and Shore, by Illa Podendorf, 47 pp., illus., printed, $2. Childrens Press, Inc., Jackson Blvd. & Racine Ave., Chicago 7, Ill. A book for children.

The True Book of Tropical Fishes, by Ray Broekel, 47 pp., illus., printed, $2. Childrens Press, Inc., Jackson Blvd. & Racine Ave., Chicago 7, Ill. To teach children about fish pets and how to care for them.

(United Kingdom) Sea Fisheries Statistical Tables, 1954, 38 pp. (mostly tables), printed, 2s. 6d. (35 U. S. cents). Ministry of Agriculture, Fisheries, and Food, London, England, 1955. (Available from Her Majesty's Stationery Office, London). Includes statistics on the quantity, total value, and average value of fish and shellfish production in England and Wales by species, region, and other categories for 1954. Breakdowns by first-class British vessels (steam trawlers), demersal landings, and pelagic landings are presented. Data on imports and exports are included. Also given are the number of fishermen, number and gross tonnage of vessels, and number of first-class vessels by stations and type of gear.

Der Walfang der Gegenwart (Present Day Whaling), by Dr. Kurt Schubert, 214 pp., illus., printed, DM 60. From Handbuch der Seefischerei Nordeuropas (Handbook of the Sea Fisheries of Northern Europe), Bd. XI, H. 6 (vol. XI, no. 6). E. Schweizerbart'sche Verlagsbuchhandlung, Stuttgart, W. Germany, 1955. A treatise dealing with the many aspects of the whaling industry. It covers the life history of the whale, gear and equipment used in the catching of whales, and the processing of the products obtained from the whale.

(White Fish Authority) Grants and Loans for Encouraging the Formation and Development of Voluntary Arrangements on a Co-Operative Basis in the White Fish Industry, Sea Fish Industry Act 1951, Northern Ireland (Sea Fish Industry) Order 1951, C.1, 2 pp., processed. White Fish Authority, Tilbury House, Petty France, London, S.W. 1, England.

(White Fish Authority) Loans for Acquiring Nets and Gear, Sea Fish Industry Act 1951, Form NG 1 (Revised), 2 pp., processed, January 9, 1956. White Fish Authority, Tilbury House, Petty France, London, S.W. 1, England.

(White Fish Authority) Loans for Providing, Acquiring, Reconditioning or Improving Plants for Processing White Fish, Sea Fish Industry Act 1951, Northern Ireland (Sea Fish Industry) Order 1951, P.R.I. (Revised), 2 pp., processed. White Fish Authority, Tilbury House, Petty France, London, S.W. 1, England.

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INT.-DUP. SEC., WASH., D.C. 100190

COMMERCIAL FISHERIES REVIEW MAILING LIST BEING CIRCULARIZED

Federal regulations require that all mailing lists be circularized periodically. A circularization letter was sent to all those on the Commercial Fisheries Review mailing list. (Individuals or firms who have requested their name added to the mailing list subsequent to March 1, 1956, were not sent a circularization letter and will be retained on the mailing list, unless the recipient meanwhile requested his name removed.)

Firms or individuals who did not return the circularization letter will be dropped from the Commercial Fisheries Review mailing list.

This issue (June 1956) is the last one you will receive unless you returned our circularization notice requesting that your name be retained on the Review's mailing list. If you did not return our circularization letter and you do not want to miss any issues of the Review, let us know promptly.

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